

**Dental**

**Abstracts**

*A selection of world dental literature / Volume 4 · Number 8 · August 1959*



1

1

**Dental**

**Abstracts**

*A selection of world dental literature*

*Lon W. Morrey, D.D.S., editor*

*N. C. Hudson, assistant editor*

**SECTIONS**

- Anatomy *page 8*
- Anesthesia and analgesia *page 30*
- Anthropology *page 48*
- Dentistry around the world *page 54*
- Case reports *page 39*
- Education *page 11*
- Fractures *page 31*
- General *page 55*
- History *page 50*
- Oncology *page 36*
- Operative dentistry *page 16*
- Oral surgery *page 33*
- Orthodontics *page 23*
- Pedodontics *page 25*
- Periodontics *page 22*
- Physiology *page 12*
- Plantation *page 27*
- Practice administration *page 53*
- Prosthetic dentistry *page 19*
- Public health dentistry *page 43*
- Roentgenology *page 3*
- Therapeutics *page 41*
- New equipment *page 59*
- Doctoral and Masters' dissertations *page 60*

AMERICAN DENTAL ASSOCIATION 222 E. SUPERIOR ST. CHICAGO 11

Published monthly by the American Dental Association at 1009 Sloan Street, Crawfordsville, Indiana. Entered as second class matter at the Post Office at Crawfordsville, Indiana, under the act of March 26, 1956. Change of address notices, undeliverable copies, orders for subscriptions, and other mail items are to be sent to editorial and executive offices, 222 East Superior Street, Chicago 11, Illinois. Printed in U.S.A. Subscription \$8.00 a year in U.S.A.; \$9.00 outside U.S.A. Single copy \$1.00. Issue of August 1959, Vol. 4, No. 8. Copyright 1959 by the American Dental Association. All expressions of opinion and statements of supposed fact are those of the author of the abstracted article and are not to be regarded as expressing the views of the American Dental Association unless such opinions or statements have been adopted by the Association.

**Dental  
Abstracts  
has  
these  
purposes**

1. *To present a selection of pertinent literature representative of all points of view within the profession;*
2. *To provide, by a few hours' reading, a survey of the significant advances being made by dentistry throughout the world, as reflected in current dental literature; and*
3. *To supply enough data in each abstract and digest that the reader may determine whether he wishes to refer to the original article for more complete information.*

**How  
to order  
original  
articles**

*The abstracts are grouped in broad classifications. The specialist will learn from this periodical of work done in other fields as well as in his own. The general practitioner will be able to keep abreast of current knowledge in the various specialties. Unless otherwise indicated, the original article is in the language implied by the title of the magazine in which the article appeared.*

*Articles from which abstracts have been made are on file in the Library of the American Dental Association and may be borrowed by subscribers to DENTAL ABSTRACTS. Requests for original articles should be addressed to the Bureau of Library and Indexing Service, American Dental Association, 222 East Superior Street, Chicago 11, Illinois. Only three articles may be borrowed at one time, and they may be kept no longer than one week. No charge is made to subscribers for this service.*

## Roentgenology

## Introduction to x-ray television

P. Botden, *M.Mundi* 4:73-76 Jan. 1959

A unit, combining roentgen image intensification with television, has been introduced by the N. V. Philips' Gloeilampenfabrieken, Eindhoven, The Netherlands. This unit was designed to serve medical, dental and especially educational purposes.

In the unit, a television pick-up tube, the so-called vidicon tube, is provided with a specific built-in photoconductive layer. This layer has a low electrical conductance in darkness but becomes highly conductive as soon as it is exposed to light.

The complete (closed) circuit television system consists of a camera pick-up, a camera control unit and a monitor—all commercially available.

Because the television circuit permits an increase in contrast effects in the roentgen image intensifier, most diagnostic procedures can be reproduced visually.

The roentgen image intensifier is attached to the Vidicon camera by a tandem lens system consisting of two Schneider Xenon objectives (1: 1.5/55 mm.). The circular image on the viewing screen has a diameter of 14 mm., is projected on the photocathode and the enlarged roentgen image becomes visible on the monitor screen. The monitor can be installed anywhere convenient to the observers. Consequently there is freedom of choice in selecting the desired position of the operator and the patient. Radiation hazards for the operator are thereby reduced or completely avoided. Exposure of the patient is reduced as the radiation is decreased by the image intensification approach.

The suggested floor plan (Fig. 1) and the circular arrangement of the unit (Fig. 2) are shown in self-explanatory diagrams.

If required, five or even more monitors can be connected to the camera control unit. By using a

cable up to 300 meters long, the roentgenograms can be transmitted to observation rooms or lecture theaters situated at some distance from the examination room.

Even an aerial transmission to other buildings with link connections is possible; the distances are limited only by the same obstacles as are encountered in usual television transmissions.

N. V. Philips' Gloeilampenfabrieken, Eindhoven, The Netherlands

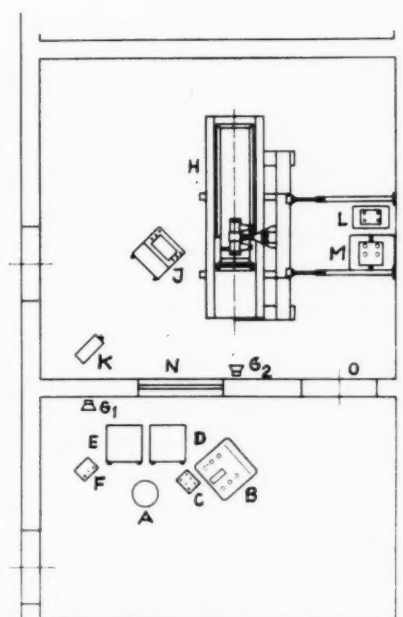


Figure 1 Floor plan of the unit (examination and observation room). A, roentgenologist's seat; B, standard desk; C, remote control box; D, television monitor (fluoroscopy); E, television monitor (treatment area); F, intercommunication switch box; G1, intercommunication loudspeaker (examination room); G2, intercommunication loudspeaker (observation room); H, circular arrangement of the unit (observation room); J, television monitor (for the assistant); K, television camera; L, smoothing device; M, generator; N, lead glass window; O, lead door

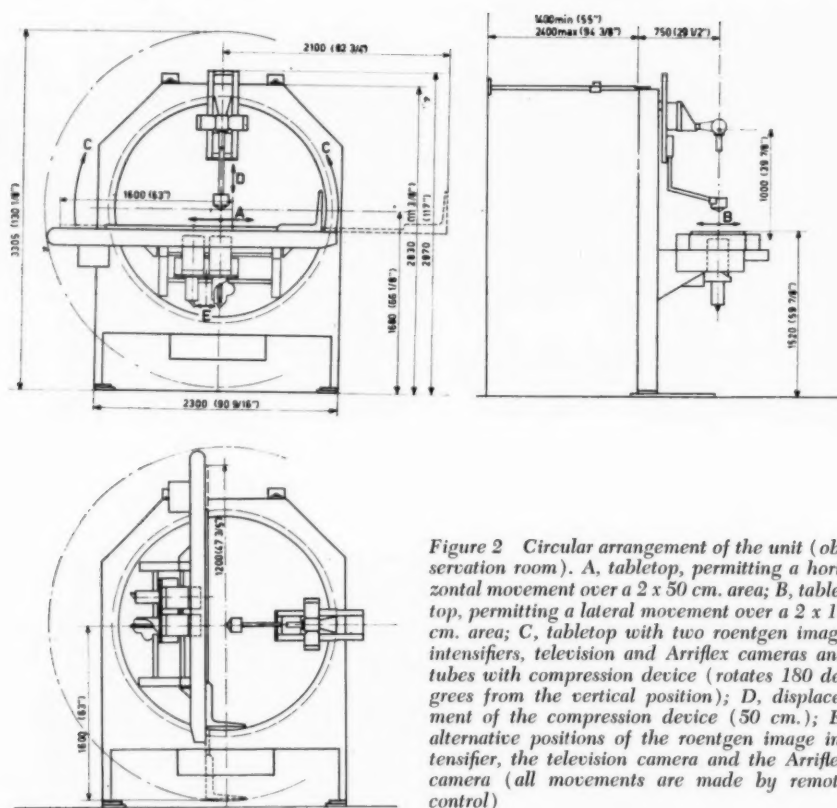


Figure 2 Circular arrangement of the unit (observation room). A, tabletop, permitting a horizontal movement over a 2 x 50 cm. area; B, tabletop, permitting a lateral movement over a 2 x 15 cm. area; C, tabletop with two roentgen image intensifiers, television and Arriflex cameras and tubes with compression device (rotates 180 degrees from the vertical position); D, displacement of the compression device (50 cm.); E, alternative positions of the roentgen image intensifier, the television camera and the Arriflex camera (all movements are made by remote control)

# Plastic roentgen-ray phantoms

J. F. Roderick. *Am.J.Roentg.*  
81:331-335 Feb. 1959

Since the discovery of the roentgen ray, roentgenologists and researchers have demanded humanlike test objects—phantoms—to facilitate experimentation in the study of radiation dosage, and to evaluate equipment, accessories and exposure technics.

The material used to prepare roentgen-ray phantoms should be: (1) roentgenographically comparable to human tissue in absorption of primary radiation and emission of secondary radiation, (2) able to penetrate dry bones, (3) safe and reasonably easy to process, (4) stable under normal conditions, (5) durable, and (6) if possible, uncolored and transparent.

A recent survey of 16 different materials showed that Bio-Plastic demonstrated an absorption coefficient and secondary radiation characteristics essentially equal to human tissue. Since this material also met most of the other requirements listed, it was further investigated.

Available from Ward's Natural Science Establishment, Inc., Bio-Plastic is a casting plastic of the thermosetting polyester family. Liquid monomer is changed to a solid by the addition of a catalyst. The material can be handled with a minimum of special apparatus and is comparatively inexpensive.

As of now, a "hand," a "skull," and a "dental" roentgen-ray phantom have been fabricated by Ward's and tested. Since the osseous components are of South Asian origin, the phantoms are about 13 per cent smaller and slightly less opaque than

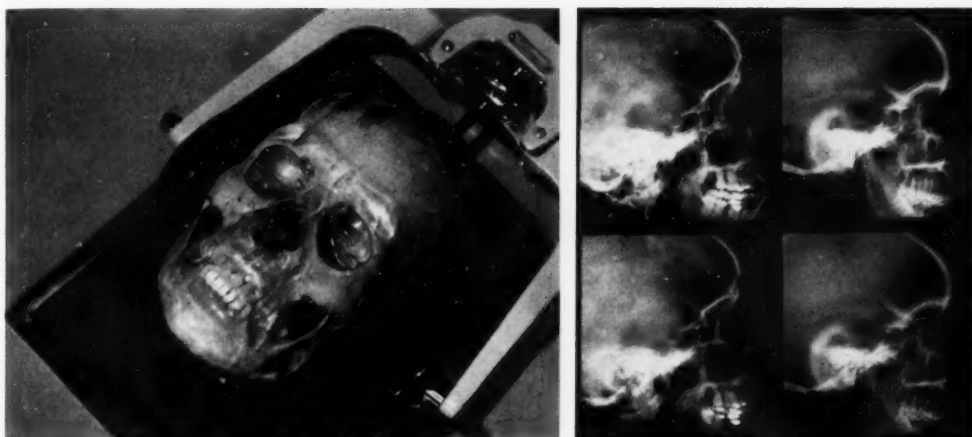


Figure 1 Left: Photograph of "head" phantom illustrates use of a head clamp to establish necessary part-film relationship. Right: Reproduction of lateral roentgenograms made using human head (16 cm.) on left and phantom (14.5 cm.) on right at 40 inches with a 16:1 grid and Par Speed intensifying screen. Upper films: 58 kv. peak and 150 ma.sec. Lower films: 80 kv. peak and 35 ma.sec.

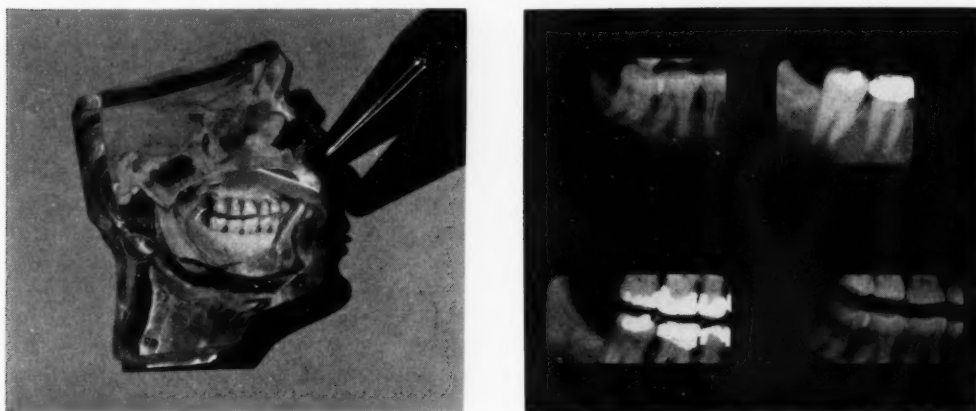


Figure 2 Left: Photograph of "dental" phantom consisting of left lower three-fifths of a skull embedded in Bio-Plastic. Oral cavity is open and teeth separated about three-eighths of an inch to accommodate both periapical and bitewing dental films. Dental film and cone for roentgenographic tube are shown in position to examine upper central incisors. Right: Reproduction of periapical and bitewing roentgenograms using the dental phantom and a human head at 65 kv. peak, 20 ma.sec. and 8 inch distance with Du Pont Type 550 and Type 557 dental x-ray films. The roentgenograms which show metallic fillings were made of a "living" patient

their human American counterparts. Nevertheless, comparable roentgenograms were obtained when standard low, medium and high kilovoltage techniques were employed. Each of the phantoms has proved practical and completely satisfactory for the purpose intended. The phantoms will prove valuable in teaching and studying roentgenographic procedures. Comparative roent-

genographic studies and research programs can be facilitated by use of the phantoms or modifications of them. The differences between the absorption coefficients of bone and Bio-Plastic have proved essentially equal to those of bone and human tissue in the 40 to 130 kv. peak range.

E. I. Du Pont de Nemours & Co., Inc., Parlin, N. J.

**A comparison between bisecting plane projection and bitewing projection in roentgenographic diagnosis of proximal recurrent caries**

M. Lundberg and K. E. Marken.  
*Svensk tandläk. Tskr.* 51:481-490 Aug. 1958

An experiment was made in an effort to discover what roentgenographic projection technic is most suitable in diagnosing proximal recurrent caries by means of roentgenograms.

Each of 25 patients received two clinical examinations, and each received two series of roentgenographic examinations; one series was made with the bisecting plane technic (apical projection), the second series with the bitewing technic.

Two independent investigators, one experienced and the other inexperienced, examined the two series of roentgenograms for the purpose of diagnosing proximal recurrent caries. Their findings were compared with those resulting from the clinical examinations.

Although from the standpoint of dental anatomy and projection technic, it would seem logical that bitewing roentgenograms are superior when diagnosing proximal recurrent caries, in this investigation, however, there was little difference in the results obtained by the different roentgenographic technics.

A new investigation is planned with a greater number of investigators examining the roentgenograms.

*Royal Dental School, Stockholm 3, Sweden*

**Injuries from ionizing rays and their prevention**

G. Fuchs. *Wien.med.Wschr.* 108:269-273  
Aug. 9, 1958

The use of ionizing rays in medicine, dentistry and industry has increased steadily since their discovery about 60 years ago. Prevention of injuries from these rays has assumed increasing importance because of the following reports appearing in the literature: (1) description of the injuries sustained by Japanese survivors of the atom bomb explosions in Hiroshima and Nagasaki; (2) description of damages caused by radioactive substances used in various industries, and

(3) warnings of the possible dangers involved in dental and medical roentgen-ray examinations and roentgenotherapy.

The most frequent source for perilous radiation is the isotope. Nuclear reactors produce radioactive isotopes by bombarding carbon, iodine, iron, phosphorus, sulfur and other elements.

Radiation by cosmic rays, minerals, radium and radon may be absorbed by the human body. Every man, woman and child is being exposed to an annual dose of from 150 to 300 milliroentgens. In the phylogenic process, sufficient adjustment to this radiation dose is developed; larger doses of ionizing rays, however, may result in irreparable damages.

The results of the uranium and plutonium radiation at Hiroshima and Nagasaki as well as those of the nuclear bomb explosion at Bikini proved the carcinogenic effect of ionizing rays. Malignant tumors have been observed in patients after the administration of thorium X for diagnostic purposes. Ionized radiation may also produce leukemia and mutations in the germ plasma.

Most radiation effects concern only the immediately involved person. Genetic effects of ionized rays, however, have transformed radiation protection to an important social problem. Studies of the effects of natural radiation must be supplemented with investigations of the effects of artificial radiation.

Radioactive isotopes, produced by explosions of atom or hydrogen bombs, remain in the stratosphere for years, and by sedimentation in the humus portion of the earth's soil, become parts of plants, and thereby food for animals and human beings. Strontium<sup>90</sup>, in the milk of cows feeding on such plants, will gain access to human bodies where it may remain active for many years promoting the development of malignant tumors and leukemia. It also may give rise to defects in the offspring.

Roentgen-ray diagnosis is harmless to all except pregnant women; the taking of dental roentgenograms, therefore, should be avoided, if possible, in the early months of pregnancy. With rational and proper indication and use, dental and medical roentgenography and roentgenotherapy produce no special danger to the fetus.

The International Radiation Protection Commission has published provisions and rules de-

termining the maximum permissible exposure to ionizing rays. Adequate observation of these rules is essential for members of the dental and medical professions.

There is no doubt that protection against radiation hazards is a serious problem which occupies the attention of professional men as well as of the general public.

Extreme anxiety must be avoided as well as unjustifiable parallels between the effects of nuclear bombs and those of carefully calculated dental or medical roentgenography. It must be kept in mind that radiation plays an important role in the diagnosis and treatment of patients who could be helped in no other way.

*Steingasse 25, Vienna 3, Austria*

#### **A limited survey of radiation exposure from dental x-ray units**

Robert O. Corson, Ronald M. Halvorsen,  
Jesse Lieberman and Edward V. Aitken.  
*Radiology* 72:1-13 Jan. 1959

In 1956 the Department of Public Health of the City of Philadelphia began a study of radiation exposure from various medical x-ray units. Dental units were chosen for initial investigation because of their number and wide use, and because the training of personnel in the measurement of their radiation characteristics is relatively easy. The purpose of the survey was to estimate how much radiation is being received by dentists, their assistants and their patients, and to provide a basis for considering practical methods for reducing unnecessary radiation exposure.

Measurements were made on 56 dental x-ray units, of which 13 were in city clinics and institutions, 1 was in a private hospital and the remaining 42 were in the offices of dentists engaged in private practice. The following conclusions were reached:

1. The radiation exposure to dentists and their assistants included in this study appears to be on the average considerably less than 100 mr per week, which is the maximum permissible average weekly dose to the total body for occupational exposure as recommended by the National Committee on Radiation Protection. The fact that many dentists can receive very low radiation ex-

posure in the course of their work indicates that for others there is considerable room for improvement. The average of the readings on film badges worn by dentists and their assistants was 45 mr per week. Of the 140 film badge readings, 11 were more than 100 mr per week, and 2 of these exceeded 300 mr per week.

2. The majority of the 56 dental x-ray units included in this study were producing excessively "soft" radiation, indicating that most of them had insufficient added aluminum filtration. It is recommended that dentists use operating tube potentials and added filter combinations so that the h.v.l. (half-value layer) in aluminum of the primary beam is not less than 1.8 mm. and preferably greater than 2.0 mm.

3. About 50 per cent of the dental units had primary beam diameters at the tip of the cone which were larger than necessary for routine dental roentgenography. It is recommended that the beam diameter be limited to not more than 3.0 inches, and preferably to less than 2.5 inches.

4. The variation in the radiation characteristics of the dental units, and differences in roentgenographic technic and film types used by the dentists, resulted in radiation exposure to the patient ranging from 0.4 to 15.8 r (in air at the skin) for periapical molar roentgenograms.

5. A limited study was made on the effect of added aluminum filtration on the diagnostic quality of molar roentgenograms. The results indicate that the diagnostic quality of dental roentgenograms is not a sensitive function of total filtration ranging from about 1 to 6 mm. of aluminum for an operating potential of 65 kvp (or within a h.v.l. range of 1 to 3 mm. of aluminum). The results indicate further that normally it should not be necessary to exceed an air exposure dose to the patient of 3.0 r for a periapical molar roentgenogram, and it is feasible to reduce such exposures to less than 1 r with currently available techniques.

6. A review of the roentgenographic techniques for minimizing patient exposure indicates the necessity for a comprehensive and objective study of all the factors (physical, psychological and physiological) that determine the diagnostic adequacy of dental roentgenographic examinations.

*3400 Spruce Street, Philadelphia 4, Pa.*

Anatomy

**Tooth attrition and "dentin lesion"  
in comparative odontology**

Albert Keil. *Deut. Zahnärztebl.* 13:24-27  
Jan. 8, 1959

The recent theory concerning the possible existence of a specific "dentin lesion" can be verified only if the principles of comparative odontology are applied to the histologic investigations. Comparative odontology, however, is seldom used in dental research, although it could be of considerable value in the determination and evaluation of human phenomena such as lesions of the tooth structures and the consequences of attrition.

In *Rodentia* and *Lagomorpha* the incisors grow continuously. Similar incisal growth is found in some species of *Lemuroidea*, especially *Daubentonia madagascariensis*.

A phenomenon, resembling the continuous growth of the incisors in these animal species, can be observed also in human teeth, involving the formation of secondary dentin, the appositional growth of cementum and the "growing out" of the teeth from their alveoli.

All species of *Lagomorpha* and some species of *Rodentia* have molars with exposed apices. In these animals, tooth attrition and extrusive tooth growth are in balance during the entire life. In the male *Cavia porcellus* (guinea pig) an attrition of 2.4 mm. per week in the lower incisors and of 1.9 mm. per week in the upper incisors occurs. In *Thomomys bottae* (North American pocket gopher) an attrition of 7 mm. per week and a corresponding extrusive growth of 7 mm. per week were observed. These measurements demonstrate that within a period of from 30 to 40 days the entire enamel and dentin of the incisors are renewed. Without interruption, new dentin is being exposed in a physiologic process which, however, cannot be regarded as causing "dentin lesions."

The exposed dentin of the continuously growing incisors is not a lesion. In *Bradypus* (sloth), *Orycteropus* (aardvark), *Odontoceti* (toothed whale) and in most of the species of *Nonruminantia*, the continuously growing teeth are not covered by enamel. In the teeth of these animals, as well as in the molars of elephants, extensive areas of dentin and cementum are exposed but these phenomena cannot be regarded as lesions.

The teeth of most fish species consist of pure dentin; a superficial layer of durodentin replaces the enamel and permits adequate function. This durodentin layer, however, has not been determined phylogenetically.

If a part of a rat incisor is cut off artificially—a procedure which can be compared with a tooth

*Figure 1 The continuously growing gigantic incisors of Daubentonia madagascariensis*



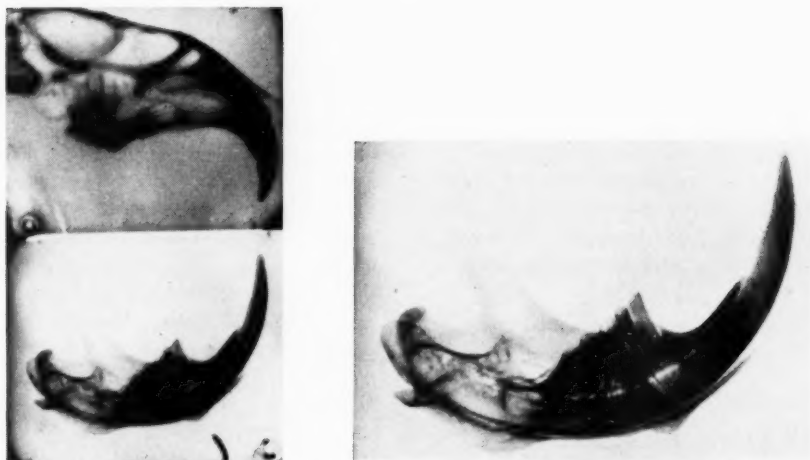


Figure 2 Left: The continuously growing incisors of the pocket gopher (*Thomomys bottae*). Right: The continuously growing molars (with expose apices) of the pocket gopher



Figure 3 Masticatory surface of a molar of the African elephant (*Elephas maximus*). Light wavelike enamel ribbons surround the dark diamond-shaped dentin areas (severe attrition)

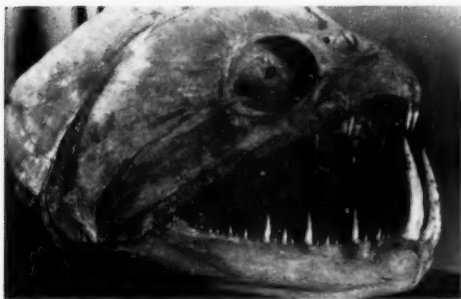


Figure 4 Teeth of the South American fresh water fish (*Raphiodon vulpinus*) consisting of pure dentin

fracture or a preventive extension of a cavity in the tooth in humans—interstitial liquid (dentin liquor) is lost, and the only observable tissue response consists in an additional formation of enamel and dentin.

During operative treatment of human teeth involving the dentin, the phenomenon of "peripheral pulp trauma" may occur. The so-called "dentin lesion" caused by such a surgical intervention should therefore be termed "peripheral pulp lesion."

*Klinikstrasse 37, Giessen, Germany*

#### **Some anatomical features of the mandible**

A. C. Gabriel. *J. Anat.* 92:580-586 Oct. 1958

In extreme resorption of the alveolar process of the edentulous mandible, the mental foramen and part of the mandibular canal traversing the body of the bone may disappear and the inferior dental nerve come to lie upon the body of the bone in the soft tissues. A review of anatomical literature shows that such a condition has not been described previously.

Two mandibles are illustrated which show the disappearance of the mental foramen and part of the mandibular canal. In the first specimen, the body of the bone varies in thickness from

6 to 13 mm. In the region of the second and third molars, and where the upper surface of the body slopes up into the ramus, the inferior alveolar nerve was covered by a thin lamina of bone, but more anteriorly the mandibular canal was transformed into a groove. This groove became shallow and indistinct in the bicuspid region. Branches of the nerve passed into the bone and one large branch entered the bone in the cuspid region, but the main trunk of the nerve lay along the surface of the bone. This bone shows fairly uniform resorption throughout the body.

The question arises: Does the level or height of the mental foramen relative to the lower border of the mandible alter in maturity? To test this, measurements of the perpendicular distance of the mental foramen to the lower border were made on 21 dentulous, 21 partly edentulous and 21 edentulous mandibles. The mean measurement for each group was found to be 13.8, 13.0 and 13.0 mm., respectively. The difference between these means is not significant.

A further series of measurements indicated that the smaller the angle of a mandible (that is, the more upright its ramus), the higher will be the mandibular foramen, the greater will be the distance of this foramen forward from the posterior border, and the broader will be the ramus.

*University of Sydney, Sydney, Australia*


 Education
**History of periodontics in Turkey**

Suat Ismail Gurkan. *Parodontopathies*  
15:262-264 July 1958

The only school of dentistry in Turkey was founded in 1909 as part of the Faculty of Medicine of the University of Istanbul. The educational program of the school resembled that of French dental schools. Periodontics was taught only within the courses of dental pathology. Clinical facilities for the study of periodontics, however, were not available.

Although the young dentists, entering dental practice, had not received adequate training in periodontics at the school, they often attempted to treat patients with periodontal disease by obsolete methods. No significant changes in the teaching of periodontics and in the treatment of periodontal disease took place within the next 12 years.

In 1922, the study of periodontics was incorporated into courses on operative dentistry. Periodontics, endodontics and exodontics were taught at the school's dental clinics.

In 1930, a few years before a systematic reform of the school's educational program was initiated, a clinic for periodontics was established, necessitated by the enormous increase in the incidence of periodontal disease in most of the country's districts.

Unfortunately, however, the designers of the new education program considered the clinic for periodontics as unnecessary, and the clinic was discontinued in 1934.

Periodontics then was taught in the following departments: (1) oral surgery; (2) dental pathology, and (3) operative dentistry.

At present, at least eight hours monthly are devoted to the courses on periodontics which include traumatic occlusion.

In the near future, it is planned to teach periodontics as a separate course that will provide

the students with adequate clinical and laboratory experiences.

In accordance with this plan, the newly created department of periodontics will provide courses on dental pathology and operative dentistry in relation to periodontics, thereby encouraging the study of the periodontal tissues and the most recent methods in treating periodontal disease.

*School of Dentistry, University of Istanbul, Turkey*

**Royal Canadian Dental Corps School**

*J.Canad.D.A.* 25:80-83 Feb. 1959

The Royal Canadian Dental Corps School was opened in the summer of 1958 at the regular army base at Camp Borden, Ontario. This modern school provides skilled instruction to craftsmen who, on graduation, assist dental officers in many fields. In addition to teaching dental trades, the school carries out dental research and tests new equipment designed by dental manufacturing firms throughout the world. The school is commanded by Col. Bertram P. Kearney, who has a staff of senior dental officers and noncommissioned instructors.

The school also conducts refresher courses for dental officers, and studies the many problems of equipment and supply peculiar to the services. In Canada, the Army's Dental Corps also is responsible for the dental care of the Navy and the Air Force. All service dentists and members of the dental staff wear an Army uniform, whether they serve on a ship at sea, with an infantry battalion in the field, or at an air force base. At the RCDC School, instruction is given in the traditions and procedures of all services.

Several dental courses are in operation continuously at the school. These range from the basic course for dental assistants to the courses for laboratory technicians; graduates of the latter course become senior noncommissioned officers.

The Royal Canadian Dental Corps when at full strength supplies a dental officer, exclusive of administrators, for every 750 men in the Navy, Army and Air Force.

*234 St. George Street, Toronto 5, Ontario, Canada*


 Physiology
**Causes of curvature of tooth roots**

Imre Kovacs. *Rev. Belge stomat.*  
55:76-90 July-Dec. 1958

The curvature of tooth roots, whether normal or abnormal, frequently makes tooth extractions and endodontic procedures difficult. Although the roots of the permanent teeth, with the exception of cuspids, exhibit an axial and distal curvature involving mainly the apical third of the root—which is formed and calcified after eruption—the cause of the abnormal curvature is, as yet, not sufficiently determined.

Most authors have suggested that the main cause of the abnormal root curvature is the so-called "mesialization" of the entire tooth occurring prior to eruption. The tooth germs of the upper permanent incisors are situated above and distal to the alveoli into which they erupt. During development and eruption, these teeth have to move over a mesially curved course (Fig. 1, left). If the mesialization would be a significant factor in the formation of root curvature, the roots of the upper central incisors would be mesially curved (Fig. 1, right). In fact, however, the roots of these teeth usually exhibit a distal axial inclination to their occlusal surfaces.

The tooth germs of the upper lateral incisors generally lie palatally inclined, and the route these teeth have to travel before eruption resembles a labially inclined curve (Fig. 2). According to the mesialization theory, this would indicate the presence of a labial root curvature. In most instances, however, a lingual or a palatal curvature is present.

The tooth germs of the upper first molars are situated so that the occlusal surfaces are inclined toward the pharynx; those of the lower first molars lie inclined toward the orifice of the mouth

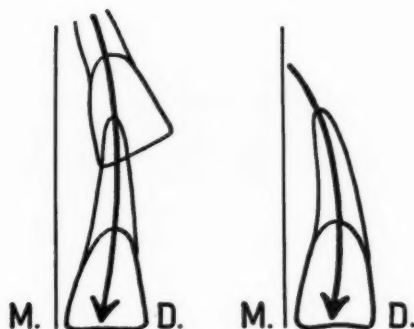


Figure 1

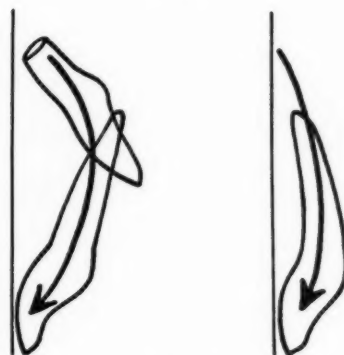


Figure 2

(Fig. 3). Prior to eruption, both tooth types travel over a course which is mesially curved. This mesial course is especially observable in lower first molars which have to articulate with the opposing upper first molars after a mesial shift.

Only in the lower teeth does the curve of the eruption course resemble that of the roots after eruption. In upper teeth, the root curvature appears to be inversely curved as compared with the eruption route (Fig. 4). Because the roots usually are not completely developed and calcified at the time orthodontic treatment is initiated, tooth movements obtained by inserted appliances often produce artificial root curvatures (Fig. 5).

The air pressure in the maxillary sinuses appears to be much stronger than in the oral cavity, especially when air is being drawn into the lungs. This increased air pressure often exerts an unfavorable influence on the growth and development of the teeth prior to eruption, intensifying the root curvature. The lower part of the maxil-

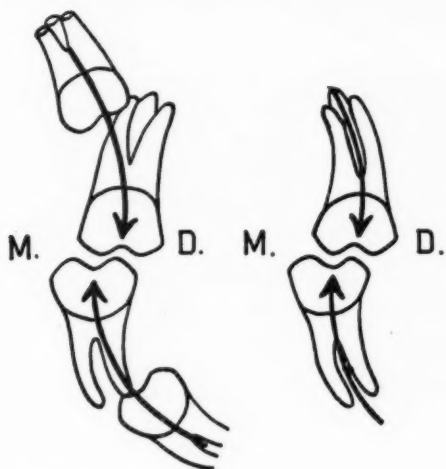


Figure 3

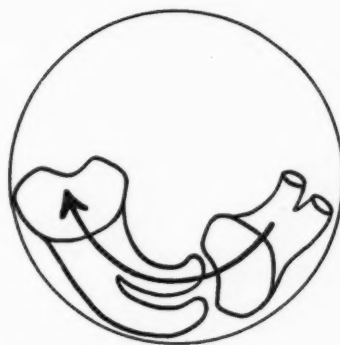


Figure 4

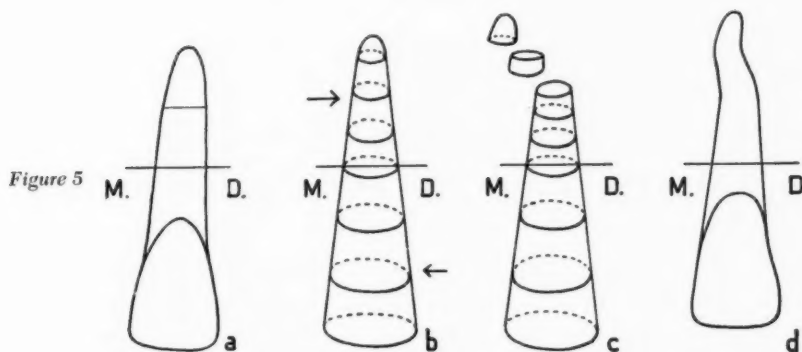


Figure 5

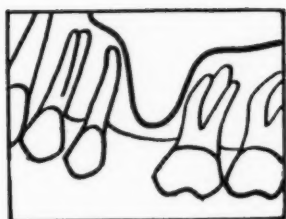


Figure 6

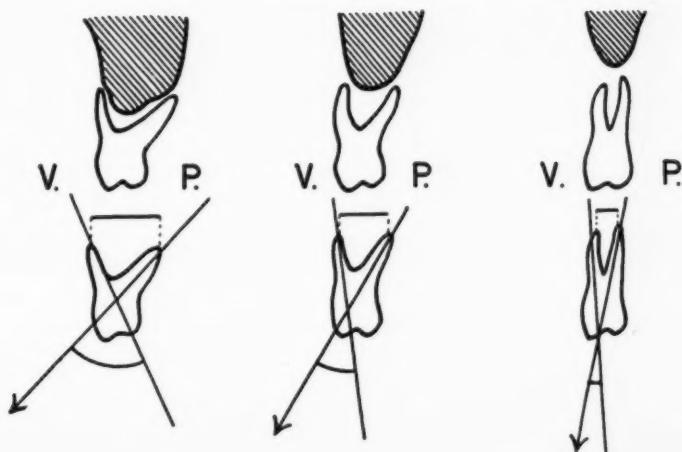


Figure 7

lary sinus frequently tends to occupy the site of an extracted upper first molar (Fig. 6).

The expansion pressure may affect the development of the roots and consequently their curvature after eruption if: (1) the roots are not completely developed and calcified in which instance the curvature of the bicuspid roots will be mesial and that of the molar roots distal to the axes, and (2) the roots are completely developed and calcified in which instance the curved root apices, covered by thin layers of osseous tissue and mucous membrane, will project into the maxillary sinuses. The influence of pressure exerted by the maxillary sinuses on the development of root curvature (palatal inclination) is often seen in dental practice (Fig. 7). It appears certain that the floor of the nasal cavity also exerts an influence on the roots, producing an increased curvature.

The abnormal inclination of the incisal edges toward the axes of the roots often forces the anterior teeth into a mesial movement, thereby producing a distal root curvature involving the apical third. This can be observed in instances in which the length of the dental arches has been increased by the growth of bone tissue and by a forced forward positioning of the permanent anterior teeth.

It can be concluded that the curvature of the apical third of the roots cannot be caused by mesialization during tooth eruption. The root curvature is produced by anatomic (muscular) forces. In most instances, the alveolar bone has changed its position anteriorly and buccally to support the teeth in their new position.

*Dental Institute, University of Brussels, Belgium*

#### **Variability of tooth formation in man**

S. M. Garn, A. B. Lewis and D. L. Polacheck.  
*Science* 128:1510 Dec. 12, 1958

Data on the timing of tooth formation are of potential value in several applications, from estimating the age of skeletal remains and accident victims to investigating the dental development in precocious puberty.

Values for tooth formation commonly given in the literature greatly underestimate the variability

that exists. The authors used serial roentgenograms of 255 white Ohio-born participants in the Fels Longitudinal Studies to determine the time of occurrence of three stages of formation in five mandibular teeth (two bicuspid and three molars) on an individual basis. Percentiles were computed.

The 5th and 95th percentiles from the present study were compared with the "ranges" given by Kronfeld (1935). The 5th and 95th percentiles greatly exceed in magnitude the ranges previously given, for each of 14 tooth-stage comparisons. On the average, the present ranges and those published by Kronfeld differ by a factor of 3.

The most likely explanation for the fact that variability of tooth formation as determined here is so much greater than hitherto accepted lies in the extremely small samples previously investigated. The present data, though not intended for use as norms, are based on from 32 to 196 examples of each stage of each tooth considered.

*Fels Research Institute, Yellow Springs, Ohio*

#### **The clinical eruption of permanent teeth and observations noted during this period**

A. Hargreaves. *Odont.Rev* 9:281-286  
Oct. 1958 [in English]

The period of time from the emergence of portions of a crown of a tooth into the mouth to the attainment of full function by contacting the antagonist on closure may be defined as "clinical eruption." In 64 children the clinical eruption of 157 permanent teeth was investigated; in a further group of children 150 teeth were observed over two or three stages of eruption only. Exactly 131 incisors and cuspids, 84 bicuspid and 92 molars were examined. Mean times for each grade of eruption to be reached was tabulated. The average time of eruption of the incisors was 9 weeks; of bicuspid, 12 weeks and of molars, from 10 to 14 weeks.

In incisors, the pattern of eruption was as follows: the central mamelon appeared first, with gradual exposure of the whole incisal edge. Clinical eruption was completed with about 4 mm. of the anatomic crown being exposed in the mouth. Maxillary central incisors usually erupted with a diastema between them, which closed after the

appearance of the lateral incisors. Lack of space in the lower incisor region occasionally resulted in delayed eruption with retroclination and mesiolingual rotation of the crown. The eruption of the lower incisors rarely caused trauma to the gingival pad overlying the erupting upper incisors.

The cuspids erupted more slowly but in a manner similar to that of the incisors; only 4 to 5 mm. of the crown was exposed when occlusion was attained.

In the eruption of bicuspid, the buccal cusp appeared first, followed by the lingual cusp and then exposure of the entire occlusal surface. In the lower first bicuspid, however, the short lingual cusp was covered with a flap of soft tissue which remained closely adapted to the occlusal surface and food stagnation was rare. The flap gradually became smaller as the tooth erupted, taking about 13 weeks to attain functional occlusion; the lower second bicuspid reached this stage in 11 weeks. In upper bicuspid, at the appearance of the lingual cusp a band of soft tissue frequently separated the lingual from the buccal cusp. This tissue bridge gradually became smaller, rarely parting in less than three weeks and occasionally remaining intact for as long as seven weeks. In some instances, the exfoliation of the deciduous molars resulted in exposure of the entire occlusal surface. In the event of prolonged retention of deciduous molars, rotation or displacement of the permanent successor usually occurred.

Of the molars, only the eruption of the first and second was studied. In lower molars, the mesiobuccal cusp appeared first, followed by the mesiolingual cusp and distobuccal cusp. In upper molars, the mesiobuccal cusp was seen first, followed by the distobuccal cusp and then the mesiolingual cusp together with the Carabelli cusp if present and large. The gingival flap which, in the lower molars, loosely covered the distal cusp or marginal ridge, and in upper molars covered the distolingual cusp and marginal ridge, often was traumatized, swollen and inflamed with food debris beneath it. After eruption of the molar, this flap gradually decreased in size. The second molars, especially in the mandible, frequently were covered distally by the flap for as long as eight weeks. The upper molars

occasionally had a tissue bridge similar to that seen in the upper bicuspid. The erupted opposing tooth sometimes traumatized the gingival flap overlying the erupting tooth, breaking down the soft tissue cover and accelerating exposure of the crown.

Eruption of the first molars often went unnoticed by either child or parent; consequently, these teeth were not cleaned adequately, and food debris appeared in a mass beneath the distal gingival flap and remained over the occlusal surface of the tooth for several weeks. Sticky fissures could be detected in both first and second molars within ten weeks of the tooth's appearance in the mouth.

Gingival infections rarely were associated with the eruption of the permanent teeth, but such infections did appear, usually with exfoliation of a deciduous molar, in the mouths of subjects with poor oral hygiene.

*Royal Dental School, Malmö S, Sweden*

### Continuous cementum apposition

H. A. Zander and Beat Hürzeler. *J.D.Res.* 37:1035-1044 Nov.-Dec. 1958

Although Magitot (1878), G. V. Black (1887) and others have stated that cementum appears to increase in thickness with age, a review of the literature does not reveal any controlled studies on continuous cementum formation. Such an investigation was made, the material consisting of 233 single-rooted teeth taken from people ranging in age from 11 to 76 years.

The determinations of cementum thickness of 233 teeth with healthy supporting tissues showed a straight-line relationship between age and cementum thickness. The thickness of cementum was approximately tripled between the ages of 11 and 78 years. This rate was not the same for every region of the root. The cementum thickness was less near the cemento-enamel junction and more in the apical region.

The average thicknesses found for the "total root" cementum were as follows: 0.095 mm. at age 20 years, 0.125 mm. at age 30 years, 0.155 mm. at age 40 years, 0.185 mm. at age 50 years, and 0.215 mm. at age 60 years.

*Eastman Dental Dispensary, Rochester, N.Y.*

# Operative dentistry

## Temporary restorations and dressings

J. M. Mumford and H. W. Ferguson.  
*D.Practitioner* 9:121-124 Jan. 1959

Temporary restorations and dressings are used (1) to protect the dentin and pulp, (2) to avoid fracture of enamel margins or weakened cusps, (3) to prevent encroachment of the gingiva and sometimes to push the gingiva away, (4) to maintain the proximal relationships, and (5) for esthetic reasons.

Several temporary restorations are used for cavities. Gutta-percha is mainly used as a temporary restoration during inlay construction; its advantage is that it can be easily removed. Unfortunately, it does not effect a complete seal. This can be partly overcome by first applying a solvent, such as oil of cajuput or eucalyptus oil, to the cavity to improve adaptation. Those oils also are used to smooth the surface of the gutta-percha when in place. Generally, the gutta-percha is applied after the cavity has been lined. A stick of gutta-percha should be heated above the flame, not in it. The surface should remain smooth or become only slightly rough.

Zinc oxide-eugenol is widely used as a temporary restoration, largely because of its sedative value. A disadvantage is its slow setting, but this may be overcome by the addition of an accelerator, such as zinc acetate. The addition of polystyrene is said to improve the properties of zinc oxide-eugenol.

Zinc phosphate cement is better than zinc oxide-eugenol when the temporary restoration must last longer or must stand up to greater crushing forces. Examples are in filling a Class III cavity when endodontic treatment is to be carried out via the lingual fossa, or filling the box portion of a Class II cavity to leave access through the occlusal surface. Zinc phosphate cement, because of its acidity, should not be applied directly

to normal dentin in deep cavities; zinc oxide-eugenol should be applied first.

In fractures of posterior teeth resulting from caries, gross caries is removed, as much unsupported enamel as possible is retained, and retention pits are cut in several places with a small round bur. The tooth is dried and a thin mix of zinc phosphate is applied, first to the retention areas and then as a larger portion. The cement should be mixed slowly (in about 90 seconds) to give adequate working time. The exact amount of cement should be used, because trimming tends to dislodge it. The tooth contour is not restored, to avoid its breakdown during mastication (Fig. 1). For fractures of posterior teeth resulting from trauma, in which a large area of dentin has been freshly exposed, it is desirable to use a zinc oxide-eugenol dressing; this can be retained only by using a metal band. The occlusion should be checked.

In fractures of anterior teeth in younger people, in which the dentin is involved but the pulp is not exposed, the dentin should be covered with zinc oxide-eugenol and kept in place by means of an orthodontic band (Fig. 2). If more of the incisal edge is lost, an incisal loop of band material is added to provide greater retention of the zinc oxide-eugenol (Fig. 3). Care should be taken to avoid damage to the soft tissues by the edge of the band. This method, however, is poor esthetically, so the use of a celluloid crown form may be preferable. A suitable crown is trimmed to size, filled with zinc oxide-eugenol and placed over the crown of the tooth. If two small holes first are placed through the incisal edge of the crown form, excess zinc oxide-eugenol can escape.

For jacket crown preparations, gutta-percha may be used. It protects the prepared tooth from heat and cold, but it tends to come off, looks poor, leaks, and leaves the dentin sensitive; therefore it is not recommended.

A tooth prepared for a jacket crown has a large area of exposed dentin which must be protected. A suitable celluloid crown form is trimmed and fitted. It is then removed. A mix of zinc oxide-eugenol is made and some fibers of cotton wool are incorporated, and the mix applied as a protective layer in such a way that the fibers slightly overlap the gingival margin. The prepared crown form is partly filled with a suitable shade of sili-

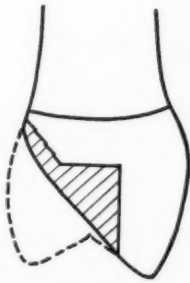


Figure 1 Upper bicuspid showing original outline of tooth (interrupted line), fracture line (zigzag), and temporary restoration (shaded)

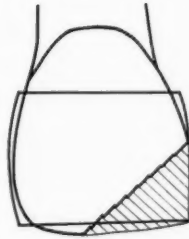


Figure 2 Upper central incisor showing band and zinc oxide-eugenol (shaded)

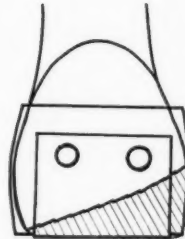


Figure 3 Upper central incisor showing band with incisal loop which has been welded to it. The zinc oxide-eugenol is shaded

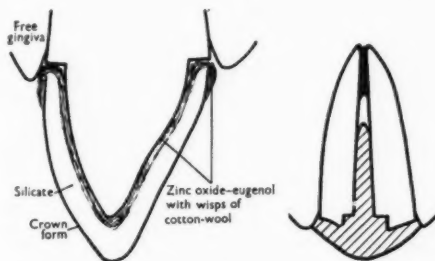


Figure 4 Temporary crown showing the zinc oxide-eugenol with wisps of cotton wool included, lying immediately over the preparation

cate cement and placed over the preparation. The overlapping fibers of cotton wool are turned back over the gingival part of the crown (Fig. 4). At the next visit this temporary crown should be preserved so that it can be reapplied if necessary.

Instead of silicate cement, self-curing acrylic resin may be used to fill the prepared crown form, in which case the crown form should be made of cellulose acetate which is later stripped off. A colorless acrylic crown form also may be used; it is filled with an appropriate shade of self-curing acrylic resin and applied to the preparation. The crown form becomes attached to the acrylic resin. A protective layer of zinc oxide-eugenol should first be applied to the preparation, for otherwise the pulp may be damaged by the free monomer or by heat from the exothermic reaction.

Gutta-percha may be used to cover a preparation for a post crown. The stick of gutta-percha is warmed and drawn out to a point so that it will be retained in the root canal. Oil of cajuput or

eucalyptus oil is applied to the preparation. The gutta-percha is applied warm, and molded to cover the root surface and so keep the gingiva in its normal position. The gutta-percha is left flush with the gingival margin and smoothed with a suitable solvent. This will be adequate for a day or two, or a temporary crown is indicated.

For pinledge preparations and three-quarter crowns, zinc oxide-eugenol with cotton wool fibers incorporated is applied to the cut surfaces. Retention is improved by a silk ligature tied around the neck of the tooth.

For veneer crowns, a suitably sized seamless aluminum shell is contoured to the gingival margin and adjusted to the occlusion. It is partly filled with zinc oxide-eugenol and seated in position. It is very soft and molds to the occlusion. When removed at the next visit, the crown can be retained and may be reapplied.

*School of Dental Surgery, University of Liverpool, Liverpool 7, England*

**Supplementary histopathological study  
on transaction of changes in pulp observed  
after cavity preparation**

Yasumasa Hori. *Bul.Oral Path., Tokyo D.Col.*  
2:2:1-44 June 1958

The material in this study consisted of 143 teeth with vital pulps, obtained from 104 patients ranging in age between 13 and 38 years. Forty-two of the teeth were used as controls.

Suitable cavities were prepared in the experimental teeth at 4,000 rpm. A new, sharp steel bur was used each time in cutting the enamel, and a comparatively blunt bur was used in the cutting that reached the dentinoenamel junction and the dentin. After the cavity had been prepared, it was lined with one of three cements—a 2 per cent paraformaldehyde cement, a zinc-eugenol cement or a zinc phosphate cement. The cavities were filled with amalgam, and the teeth were extracted under local anesthesia after 2, 4, 6, 8, 12, 16, 20 or 25 days. Of the control teeth, 21 were extracted immediately after cavity preparation, and 21 were filled with amalgam without any lining material and were extracted 30 days after filling.

Minute inspections for clinical findings were made every day or every other day. All the symptoms occurring during the cavity preparation and the period after filling were recorded. The extracted teeth were stained and studied histologically. The following observations were made:

1. The main changes in the dentin and pulp, brought about by cavity preparation, were: expansion, atrophy, degeneration or disappearance of the odontoblasts; disturbed arrangement and vacuolation in the odontoblastic layer; circulatory disturbances in the pulp, including hyperemia and bleeding; exudation of serofluid, and the presence of rod-shaped bodies in the dentinal tubules.

2. After the cavity had been prepared, the following changes occurred successively: secondary calcareous deposit in the predentin just below the cavity floor, and round cell infiltration.

3. Whether the cavity was deep or shallow, these regressive changes in the odontoblasts almost always appeared.

4. In the cavities which were filled with amalgam but were not lined, the changes listed in 1 and 2 remained, even after about 30 days.

5. If the cavity was lined, the changes accorded with the physiological effect of each drug on the pulp.

6. The choice of a lining material is important. If the cavity was lined with 2 per cent paraformaldehyde cement, healing was more clearly observed than when the other cements were used. Even under paraformaldehyde cement, however, the regressive changes in the odontoblastic layer were recognizable after 25 days.

7. Beneath the cavities lined with zinc phosphate cement, healing also occurred, but at a slower rate than when a paraformaldehyde cement lining had been used.

8. If zinc-eugenol cement was used as a cavity lining, the regressive changes increased rather than decreased.

9. Of the three lining materials tested, 2 per cent paraformaldehyde cement most strongly accelerated the healing in dentin and pulp; next best was zinc phosphate cement.

10. If the cavity was deep, no matter which lining material was used, healing always was slower.

11. No histopathological differences were noted in the healing, whether or not the patient had complained of pain during cavity preparation.

12. A reduction in pain, between the time the cavity was prepared and the tooth extracted, although not absolutely reliable, may be a valuable criterion in judging the healing process in the pulp.

13. An increase in pain, during the same period, also may be important in judging the changes occurring in the pulp tissues.

14. Lack of pain for a long period after cavity preparation does not always indicate that the pulp tissue is healing or healed.

Nineteen illustrations are presented.  
*Tokyo Dental College, Tokyo, Japan*

## Prosthetic dentistry

**The use of a silicone resilient plastic in prosthetic dentistry**

G. A. Lammie and R. Storer. *D.Practitioner*  
9:147-150 Feb. 1959

A silicone resilient plastic (Flexibase), developed and now marketed in Great Britain by Flexico Developments, Ltd., has been under clinical and laboratory trial for nearly two years. Although the material has some disadvantages, this plastic represents an advance on materials previously used. It is recommended for use as a denture lining in the following circumstances. (1) in lower complete dentures, to overcome pain when the edentulous mandible is covered by an atrophic mucosa; (2) in the Kennedy Class I lower partial denture (bilateral free-end saddles) where pain is experienced or anticipated, and (3) in upper complete dentures where the retention potential is low and the inclusion of a relief chamber is necessary.

With the lower complete denture, the patient's most common complaint is pain, experienced because of the atrophic soft tissues of the denture-bearing area. The effect of a resilient lining material over these areas is to replace in the denture some of the resilience that was present formerly in the covering soft tissues. A soft lining, however, will not compensate for inadequacies of denture construction. A well-chosen impression technic and the development of a good occlusion using teeth with a small occlusal table will ensure that the load is reduced and well distributed.

Many lower partial dentures with bilateral free-end saddles are never worn because of the pain which develops over prominent mylohyoid ridges. A simple and effective alternative to resection of these ridges is the use of soft linings in the saddle areas, combined with resilient clasping. The composite effect is to distribute the stress.

If the patient's retention potential for an upper complete denture is low, use of a resilient plastic insert ensures an intact salivary film between the mucosa and the fitting surface of the denture.

The silicone material also may be used in constructing obturators for cleft palate patients and for patients requiring appliances after oral surgery.

The silicone resilient plastic has the following advantages:

1. The curing technic is simple and rapid, requires no special equipment and is carried out on the laboratory bench. After an impression has been taken, the existing lower complete denture may be relined with the plastic within 40 minutes.

2. Resilience and dimensional stability can be maintained after constant use in the mouth for periods of more than 12 months.

3. Water absorption of the material is minimal.

Disadvantages of the material include its low bonding strength to acrylic resin, and its low resistance to abrasion.

The bonding strength is such that the use of flanges to engage an undercut cannot be recommended. If a saddle is lined, the "boxed in" effect (see illustration) is recommended, with the mar-



The resilient plastic (shaded black) is "boxed in" to reduce the shearing force between the hard and the resilient resin

gins of the denture formed in hard rather than resilient resin. Thus, the shearing forces acting between the two layers are minimized. To reduce abrasion, the use of abrasives and brushing must be avoided. The fitting surface of the denture should be cleansed by holding it under tepid running water. To minimize surface abrasion, movement of the denture in function must be avoided. Final adjustments of the occlusion should be carried out before the soft base is substituted for the original acrylic resin.

6 Clark Avenue, Edinburgh 5, Scotland

**Recording procedures  
in partial denture construction**

F. W. Craddock. *Internat.D.J.*  
8:367-369 June 1958

Impressions for a partial denture with free-end saddle should be of the static kind—that is, they should be taken with a material of low viscosity or stiffness. Whether deflection of tissue-supported saddles is great enough to be of practical significance will depend on how hard the patient bites. Recent work in the United States has shown that the masticatory pressures used by patients wearing removable prostheses are surprisingly low, as indeed is the degree of comminution necessary to the adequate digestion of food. It seems that, with complete indifference to the theories, all patients at first consciously and then unconsciously adjust their masticatory vigor to what is tolerable or comfortable. Herein lies the explanation of the success which patients obtain with prostheses of widely differing design and efficiency.

The masticatory habits and requirements of patients vary widely. An assessment of each patient's masticatory habits and expectations forms an important part of prosthetic diagnosis and the design of appliances.

The following point must be considered in recording centric occlusion for partial dentures which are partly or entirely supported by the mucosa: when the wax occlusal rims carrying the completed record of centric occlusion are in the mouth, the operator always satisfies himself that the opposing natural teeth are in contact; but when the occlusion blocks are removed from the mouth, seated on their plaster casts and brought into contact, often the natural teeth (which undoubtedly were in contact in the mouth) now are slightly separated.

The discrepancy is explained as follows: When the blocks rest on the slightly compressible or displaceable mucosa, biting force causes them to sink slightly; but a similar force applied to the natural teeth causes little or no intrusive movement. When the blocks are transferred to the rigid plaster casts, intrusive movement is impossible, and therefore the blocks cannot assume the same relative positions that they did in the mouth. As a result, the blocks appear high. This error cannot arise with dentures which are completely tooth-

supported, because intrusive movement is resisted by the occlusal rests.

The remedies are simple: (1) insistence on accurately adapted baseplates which will suffer little or no intrusive movement under load, and (2) completion of the record of centric occlusion under light biting force by closure into wax which has been softened to a considerable depth.

*University of Otago, Otago, New Zealand*

**An electromyographic analysis  
of the function of the buccinator muscle  
as an aid to denture retention  
and stabilization**

Donald O. Lundquist. *J.Prost.Den.* 9:44-52  
Jan.-Feb. 1959

This study was undertaken to determine the action of the buccinator muscle as an aid to stability and retention of complete dentures. Electromyographic recordings were obtained of the buccinator muscles of 17 subjects, of whom 6 had natural dentitions, 6 had maxillary complete dentures and mandibular removable partial dentures, and 5 had maxillary and mandibular complete dentures. Each subject repeated the same motions three times in this sequence: (1) open the mouth and close it firmly; (2) clench the teeth together; (3) suck, as if through a straw; (4) draw on a cigarette; (5) place one peanut on the last tooth on the left side, chew, and swallow it in the normal manner; (6) repeat this on the right side, and (7) chew ten peanuts normally on the side or sides preferred by the individual.

The following conclusions were reached:

1. The muscles on the working side of unilateral chewers contract more vigorously than those on the balancing side in normal opening and closing movements.

2. The buccinator muscle contracts most actively and exerts pressure on the buccal flange only on the working side of unilateral chewers.

3. The action of the buccinator muscle on the balancing side is not felt to be significant in aiding the stability and retention of the dentures in unilateral chewers.

4. Two contractions of the buccinator muscle on the working side were recorded for 12 of the

17 subjects tested. The first occurred at the time of the closing masticatory stroke just prior to reopening. The other occurred as the teeth first met the resistance offered by the bolus of food.

5. The various types of occlusion used in this test had no effect on the results.

6. The buccinator muscle is effective bilaterally as an aid in denture retention and stabilization only if the patient chews bilaterally.

7. Alteration of the contour of the buccal aspect of the buccal flange of the dentures did not result in any appreciable variation in the electromyograms.

The test results support the theory of Fish (1952) that the surface of the denture is "gripped" by the buccinator muscle and that this aids in stability.

*Fitzsimons Army Hospital, Denver, Colo.*

#### **Mastication with natural teeth and with full dentures**

F. W. Craddock. *New Zealand D.J.* 54:105-112 July 1958

Thirty-six senior dental students were asked by questionnaire to describe mastication as they observed it in others and in themselves. The replies confirmed the general belief that vigorous chewing with natural teeth normally is performed unilaterally. Only 3 of the 36 respondents described mastication as entirely bilateral. Small differences in the effectiveness of left and right sides are sufficient to establish a preference for one side. Five students pointed out that, although mastication is in the main unilateral, occasionally it is performed bilaterally, especially with soft foods in large mouthfuls. Very soft foods, such as ripe bananas and cooked tapioca, are chewed hardly at all; they are merely pressed against the palate by the tongue in preparation for swallowing.

Of the 36 observers, 28 had free occlusion; that is, gliding or lateral movements with upper and lower posterior teeth in contact were easily possible. Twenty-seven of the 28 reported that they

used lateral movement of this kind in mastication.

The vertical masticatory load which a patient with complete dentures can apply is limited by two factors: (1) pain felt in the supporting mucoperiosteum, and (2) lack of stability of the dentures. If the dentures are locked, attempts of the wearer to use a lateral movement in chewing will dislodge the dentures. Such a patient consequently must restrict himself to a soft and generally less appetizing and nutritive diet than that enjoyed by people with natural teeth or dentures permitting lateral movements. Dental literature contains overwhelming evidence that dentures which are set up and milled in to produce a free occlusion are more efficient than those which occlude effectively only in centric occlusion.

It has been asserted that the extra time and skill necessary to create dentures which permit free occlusion are expended fruitlessly because, even with such an occlusion, patients will merely mash or chop their food just as they are obliged to do with locked occlusions. This assertion has been refuted by a score of investigators, but it lives on because it would be convenient if true.

Upper and lower complete dentures were made for a 45 year old woman, and freedom of lateral movement over a small range was obtained; more extensive lateral movement caused the upper right second molar to impinge on the base material of the lower denture. Two years later, the patient returned to have duplicate dentures made. She praised her existing dentures, and said that with them "she could really chew just as she did with her natural teeth." Inspection of the dentures confirmed her statement. The upper second molar had ploughed a furrow in the acrylic resin over the lower tuberosity. In her determination to chew naturally, the patient had gradually overcome the locking and had achieved a wide range of lateral movement by wearing away acrylic resin.

With dentures designed to permit lateral movements, patients masticate as they do with natural teeth.

*University of Otago Dental School, Post Office Box 647, Dunedin, New Zealand*

Periodontics

**Histopathological study of healing process after surgical treatment for alveolar pyorrhea**

Mamoru Sato. *Bul.Oral Path., Tokyo D.Col.*  
2:45-70 June 1958

In the anterior portion of the mouths of 57 outpatients, between the ages of 19 and 69 years, with periodontal disease, curettage of the gingival pockets was performed on one side, and a flap operation on the other. Postoperatively, at different periods of time up to 100 days, 86 teeth with their surrounding tissues were extracted, prepared in serial sections, stained and studied histologically. Of the 86 teeth, 47 had been treated by curettage of the gingival pockets and 39 by flap operation. The following results were noted:

1. In the teeth extracted immediately after curettage, the curettage of the gingival wall of the pocket was nearly always incomplete; inflammatory granulations remained in many instances, and a small amount of dental calculus frequently was observed.

2. In the teeth inspected immediately after flap operation, the curettage of the gingival wall of the pocket and the root surface was almost perfectly performed and the exposed tissue of the gingiva was contacting the root surface.

3. In the material in both experimental groups, minute debris of tissue or tooth substance which had been exfoliated during the operation was observed frequently in the curetted gingival pocket. Cleansing of the surgical zone after the operation should be performed with great care.

4. The healing process was more remarkable in the teeth treated by the flap operation than by curettage.

5. In teeth treated by curettage, proliferation of the granulation tissue on the wounds and regeneration of the epithelium were observed three days after the operation. In teeth observed from 8 to 15 days after the operation, fine fibers of the

connective tissue of the gingiva began to adhere to the root. In a few teeth observed ten days after the operation, reattachment of the regenerated epithelium occurred. Considerable inflammation in the gingiva was observed up to eight days after the operation; this showed a tendency to decline during a two month period. An increase in inflammation was observed after this two month period.

6. As to the teeth subjected to the flap operation, on the third postoperative day, growth of the granulation tissue and active regeneration of the epithelium had started. Within 8 to 15 days, fibers of the surrounding connective tissue apparently had begun to adhere to the tooth substance at the root surface, and regenerative epithelium had advanced. Reattachment to the root surface was observed in almost all teeth and was most conspicuous during the eighth to the tenth day after the operation, thereafter diminishing as fibroplasia in the granulation tissue gradually progressed. After two months, the healing process remained dormant and the disease increased.

7. After the epithelial covering and reattachment were completed, a slight gingival pocket was formed. In most instances such pockets were superficial.

8. Postoperatively, materia alba frequently accumulated in the new gingival crevice. In teeth observed more than 50 days postoperatively, a deposit of dental calculus was noted inside the new gingival pockets.

9. Postoperatively, new cementum frequently was observed, without any sign of previous resorption. These deposits were found more frequently in teeth treated by flap operation than in teeth treated by curettage.

10. To perform curettage more efficiently, the scaler now universally used must be improved.

11. To aid the healing process, periodical observation and adequate postoperative treatment are essential, both with the flap operation and with curettage.

*Tokyo Dental College, Tokyo, Japan*


 Orthodontics
**Clinical orthodontics**

Ch. F. L. Nord. *J.Canad.D.A.* 25:1-12  
Jan. 1959

About 1,500 new patients annually are seen in the orthodontic clinic in Amsterdam, The Netherlands. About 3,500 patients are treated each year, with the help of four dentists working four chairside hours a day, four chairside assistants, a secretary and the laboratory staff. Two men work in the plaster room and four in the laboratory.

In most countries for which statistics are available, at least 50 per cent of the school children have orthodontic anomalies, and half of this group requires treatment urgently. This means that at least 25 per cent of the school children should be treated. Some orthodontists in the United States assert that a maximum of only 50 new patients a year can be accepted by the orthodontist. If this were so, only a token number of children could be cared for, and orthodontics would be of no great social importance. For about 30 years, the author and his colleagues have proved that a much greater proportion of children can be treated orthodontically. Often, the general practitioner can do much without the help of the specialist.

Although much remains to be learned about the problems of growth and heredity, clinical experience shows that good results can be obtained without extensive recourse to cephalometric roentgenography with tracings and drawings. These are costly procedures in time, energy and money, and do not necessarily lead to better treatment of the patient.

A study of the pictures by famous portrait painters of the past century, and studies of the dentitions of aborigines and of old skulls, reveal that Class II malocclusion is more prevalent today than formerly. What has changed is infant care. In the old days the babies often were so swaddled that they were unable to move arms

or hands. Babies were breast-fed; the baby was fed when he started to cry. Today the baby is fed at fixed times. He is permitted to cry and he looks for comfort and finds it in sucking his thumb, his fingers, his sheet or whatever he can grasp. This sucking frequently is responsible for the deformation of the upper jaw. The tongue, in conjunction with mouth breathing, may bring about abnormal expansion of the lower jaw. If there is an anomaly in the deciduous dentition, generally it has nothing to do with growth problems or with lack of space. Exogenic factors are responsible, and it is easy to redress the damage at a young age. Often, the teeth and jaws can be restored to normal in a short time with the help of a simple appliance, the oral screen.

The old school of orthodontics erred in believing that it was a waste of time to start treatment before the patient was 12 years old. To start at 12 years of age is to start too late, and is to ask for difficulties which should be avoided. This has been demonstrated in hundreds of European children.

The factor of oral muscles has been much neglected in orthodontic literature.

If the patient is treated young enough—that is, during the years of tooth eruption—retention should be unnecessary, as a rule. Relapse is proof that the treatment has been wrong.

Appliances should be as simple and as inexpensive as possible, so that they can be used by every interested general practitioner. Appliances should not harm the teeth or the surrounding tissue. As a rule, fixed appliances are outmoded. The fixed appliance is costly, difficult to make and insert, and necessitates the banding and cementing of most of the teeth, thus increasing the danger of causing caries. In most of the orthodontic centers of Europe today, removable appliances are being used, and treatment is started at the earliest possible age.

If orthodontic help is to be available to the chil-

dren who need it, the dental profession cannot go on considering dentofacial orthopedics as a difficult specialty which should be practiced only by well-trained specialists. Sufficient time must be set apart for orthodontics in the curriculums of dental schools. The dental profession should recognize that the dentist who renders orthodontic service will become an expert only after years of experience.

9 Johannes Vermeerplein, Amsterdam, The Netherlands

**A clinical analysis of orofacial morphology and behaviour of 500 patients attending an upper respiratory research clinic**

H. L. Leech. *D. Practitioner* (Tr.B.S.S.O.)  
9:57-68 Dec. 1958

This study was made to provide data bearing on theories concerning the relationship of ear, nose and throat disorders to malocclusion.

The material consisted of 500 patients attending the Upper Respiratory Research Clinic for Diseases of the Ear, Nose and Throat. Patients were not selected for orthodontic purposes. The oldest patient was 13 years old, the youngest 2 years, and the average age was 7 years. Fifty-six per cent of the patients were classified according to Angle's classification of malocclusions as Class I, 26 per cent as Class II, Division 1, 10 per cent as Class II, Division 2, and 8 per cent as Class III.

Forty-three per cent of the 500 patients had some form of atypical swallowing habits: 10 per cent had both a tongue thrust and contraction of the circumoral musculature, 25 per cent had a tongue thrust alone, and 8 per cent had a circumoral contraction alone.

Of 94 of the 500 patients who were bottle-fed only, in 43 the swallowing was atypical and in 51 the swallowing was normal.

Thirty-seven of the 500 patients (7 per cent) had an anterior interdental sigmatism or lisp. Most of these 37 patients had an associated tongue thrust and reduced incisor overbite, increased overjet, or both. In four patients with an interdental sigmatism, the swallowing and the incisor relationship were normal.

Twenty per cent of the 500 patients had incompetent lips (lips which failed to make an

anterior oral seal in their rest position), but only 6 per cent of the 500 patients had incompetent lips and also were mouth breathers. In other words, less than a third of the patients with their lips habitually apart were mouth breathers, at least during the daytime.

Ninety-three per cent of the 500 patients had hypertrophied tonsils or adenoids or both (60 per cent had large tonsils and adenoids, 31 per cent had large tonsils only, and 2 per cent had large adenoids only). Sixty per cent of the Class I (Angle) patients, 66 per cent of the Class II, Division 1 patients, 70 per cent of the Class II, Division 2 patients, and 51 per cent of the Class III patients had large adenoids. Only 10 per cent of the patients with large adenoids had narrow maxillae.

Nineteen per cent of the 500 patients were mouth breathers; mouth breathing was caused by obstructive adenoids in 13 per cent, and by allergic and infective rhinitis, sinusitis and septal defects in 6 per cent.

Sixteen per cent (80) of the 500 patients showed signs and symptoms of an allergic rhinitis, but only 29 of these 80 patients were mouth breathers.

Of 95 patients with narrow jaws, only 18 were mouth breathers.

Twenty-one of the 500 patients (4 per cent) had an anterior open bite.

Ninety-six of the 500 patients (19 per cent) sucked their fingers or thumbs at some time. The average age for this group was seven years. Fifty-five of the 500 patients (11 per cent) were sucking their thumbs up to the age of six years. Of those of all ages (42) still sucking their thumbs or fingers, about two-thirds had a tongue thrust.

One hundred and forty-one (28 per cent) of the 500 patients had increased incisor overbites but only 10 patients (2 per cent) had overclosure. Of the 141 patients with close bite, 15 sucked their thumbs and 9 were still sucking at the time of investigation. It seems certain that in most instances the increased incisor overbite is not caused by overclosure of the mandible (that is, true close bite); it is caused by an abnormal incisor relationship, with either the upper or lower incisors or both on a different occlusal level than the posterior teeth.

27 Brynhyfryd Road, Newport, England

## Pedodontics

**A simple functional space maintainer**

William P. Humphrey, *J. Colorado D.A.*  
37:20-21 March 1959

Material needed for a simple, functional space maintainer (Fig. 1) includes: (1) preformed chrome steel bands; (2) chrome steel 9 gauge palatal bar, bulk or preformed; (3) spot welder, and (4) solder and flux. The maintainer can be placed the same day that a tooth is extracted. The maintainer restores occlusion and prevents unilateral movement of the opposing teeth.

The band is placed while the dentist waits for

the anesthesia to take effect. The tooth is extracted. The space to be maintained is measured with a millimeter gauge. A preformed palatal bar is made or selected. The bar is welded to the mesial surface of the band with a spot welder. Flux is placed and solder is added for extra strength. The bar is contoured with a diamond stone to fit the opposing tooth (Fig. 2). The band is cemented to place.

This simple bar maintainer also can be used to guide unerupted first permanent molars into place (Fig. 3).

390 University Boulevard, Denver, Colo.

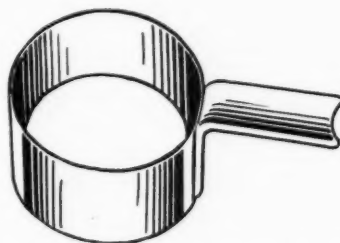


Figure 1 A simple space maintainer



Figure 2 Maintainer in place



Figure 3 Maintainer used to guide an unerupted first permanent molar into place

### Infra-occlusion

Rudolf Karwetzky. *Deut.zahnärztl.Zschr.*  
13:51-56 Jan. 1, 1958

Infraocclusion is an abnormality in which one or more teeth fail to reach the plane of occlusion without perceptible external cause.

Infraocclusion in deciduous teeth was the subject of this study. On the basis of histologic examinations, it was determined that deciduous teeth in infraocclusion showed fusion of dentin and osseous tissue on their iterradicular resorption planes. This abnormality was seen more frequently in deciduous lower molars than in any other group. Sometimes the tooth germs for the permanent teeth were missing. In the majority of instances the most severe root resorption occurred on teeth which were slow in erupting.

An examination of children, taken at random, revealed that a surprisingly large number of the teeth were in need of correction of the occlusal factor in varying degree. If the value of an immediate orthodontic correction in preventing future infraocclusion and its complication is explained adequately to parents and children, the patients will accept readily the plan of treatment proposed by the dentist.

The following considerations are a necessary part of diagnosis, prognosis and treatment planning in infraocclusion in the deciduous dentition:

1. Recording a complete patient history including data on general health.
2. Observing the patient's oral health and hygiene.
3. Determining the condition and location of the teeth in infraocclusion.
4. Testing the pulp vitality.
5. Taking full mouth roentgenographic series including bitewings.
6. Taking alginate impressions to establish food impaction regions, facets caused by resorption, probable limitations of repositioning or reshaping, the differential between infraocclusion and normal occlusion and planning the construction of splints for mobile teeth.

A comparatively simple and accurate method of securing the occlusal registration is the wax check-bite.

Robert Koch Strasse 27a, Münster/Westfalen,  
Germany

### Dental use of stannous fluoride

Paul E. Norris. *J.Am.Pharm.A.* 20:86-87  
Feb. 1959

For several years, solutions of stannous fluoride have been applied topically to the teeth of children to reduce the incidence of dental caries. Stannous fluoride, as with most salts containing the lower valence form of metals, has a degree of instability. The two properties to be guarded against are (1) oxidation of the stannous ion to the stannic form, and (2) hydrolysis of the compound by moisture to form the highly insoluble stannous hydroxide. These two properties require that the compound stannous fluoride be protected during storage in tightly sealed containers. Because of the hydrolysis of stannous fluoride, only freshly prepared solution should be used for dental purposes. Stock solutions of stannous fluoride should not be prepared.

Stannous fluoride should be handled in the open with a minimum of exposure and, except for the time necessary to weigh the compound and fill it into capsules, it should be kept in tightly sealed bottles. Care in handling is particularly important in a humid atmosphere.

At the present time, stannous fluoride is available to dentists on request from the Indiana University School of Dentistry, Indianapolis, Ind. A 50 Gm. sample is supplied gratis to dentists, with instructions for use. For convenience at the dental chair, it is suggested that the material be divided into 0.8 Gm. quantities by a pharmacist and placed in no. 2 hard gelatin capsules for use by the dentist. The capsules should be stored in a tightly closed bottle until used. The contents of the capsule are emptied into 10 cc. of distilled water in a 25 cc. beaker to make an 8 per cent solution of stannous fluoride. The plain end of an applicator stick can be used to stir the mixture to hasten solution. The freshly prepared solution may contain a small amount of finely divided white stannous hydroxide, which is insoluble. The fine precipitate does not interfere with the effectiveness of the treatment.

The container for the capsules of stannous fluoride should be labeled "For topical applications use."

Procter & Gamble Co., Box 599, Cincinnati,  
Ohio

# Plantation

## Intraosseous implants with subperiosteal extensions: a new technic

Martin de Grady. *Rev. franc. odontostomat.*  
5:1233-1240 Oct. 1958

The insertion of denture-bearing metallic subperiosteal implants is receiving increased attention from the dental profession. The importance of this procedure is sufficiently obvious to provide ample justification for its experimental and clinical use. It is still too early, however, to draw final conclusions. Several years after insertion of the implants are required before an objective evaluation can be made.

The success of subperiosteal implant methods frequently is reported but not so the failures. Most failures observed were caused by defective technics either in construction or in insertion. These technics are being improved continually, and it can be assumed that in the near future success in implantation will be obtained routinely.

A new technic, combining the advantages of subperiosteal implantation with those of intraosseous implantation, has been developed at the British Hospital in Liège, Belgium.

The selection of patients, the psychological and therapeutic procedures and the recognition of possible postoperative complications are factors which must be considered before the insertion of denture-bearing subperiosteal implants is attempted. At Liège, a single-stage operation is preferred.

The alveolar bone must be prepared carefully to receive the denture-bearing implant because certain operative and postoperative risks are involved. Infection must be avoided under all circumstances, and the tissues adjacent to the implant must be free of inflammation.

Premedication usually consists of coagulants, antibiotics and drugs counteracting or suppress-



Figure 1 The cylindric-conic fraise used for preparation of the bone



Figure 2 Surgical exposure of the bone fitting exactly the intraosseous implant

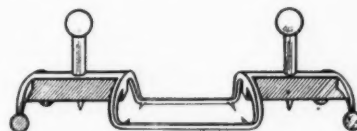


Figure 3 Intraosseous implant with subperiosteal extensions made of a cobalt-chromium-molybdenum alloy

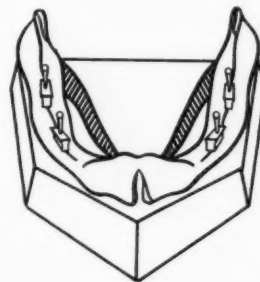


Figure 4 Implant in position on the cast model

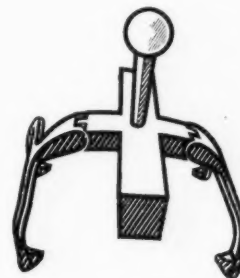


Figure 5 Intraosseous implant with movable subperiosteal joints

ing inflammation, administered for four days prior to surgery. By the use of such premedication, hemorrhagic and infectious complications and surgical trauma will be avoided.

The operation usually is performed under local anesthesia but sometimes general anesthesia is indicated. If local anesthesia is used, the patient must be well controlled, calm and relaxed, because any change in his position may cause serious complications.

Impression taking should be done as rapidly as possible but a perfect representation of the hard and soft tissues of the operative region should be obtained.

The alveolar bone is exposed by a deep incision made along the crest at the right and left retromolar regions. The mucoperiosteum is elevated without tearing or separation. The site for the implant is prepared with a cylindric-conic fraise (Fig. 1). The prepared site must fit the implant exactly in all dimensions (Fig. 2).

After the surgical preparation is completed,

the previously constructed intraosseous implant with its subperiosteal extensions (Fig. 3) can be inserted after carefully checking the fit on the model (Fig. 4). The implant is made of a chromium-cobalt-molybdenum alloy. Long transfixing sutures to prevent slipping are made through the labial and lingual tissue flaps.

After completion of the implantation, cold packs should be used for 20 minutes of each hour for 12 hours, then a compressive dressing should be placed around the patient's head to provide an adequate support for the submandibular region. On the first postoperative day the patient should receive only iced and sweetened drinks containing vitamins.

Postoperative complications are rare and the cicatrization usually is rapid. One week after surgery the sutures can be removed.

The design of the implant can be modified (Fig. 5) to fit the anatomic conditions present in the patient.

*Hôpital des Anglais, Liège, Belgium*

#### **Homogenous transplantation of cartilage in the reconstructive surgery of the face**

J. Krenar. *Rev.Czechoslov.Med.* 4:323-334  
Oct.-Dec. 1958

The main task of reconstructive surgery of the face is the repair of defects caused by congenital factors, accidents, diseases or postoperative complications. The replacement of deficient facial tissues appears to be the most important problem. Minor skin defects may be repaired by free skin grafting, tissue shifting or transplanting of grafts taken from other parts of the body. However, it is frequently necessary to repair a defect in the deeper layers or to support deficient soft tissues with a firm basis.

F. König (1896) suggested the possibility of using homogenous cartilage grafts (taken from the costal region) for repair of defects in the maxillofacial region. Since then many authors have reported that they have utilized successfully homogenous cartilage grafts as biologically well tolerated transplantation material. F. Burian

(1937) proved that homogenous cartilage grafts remain vital after transplantation even in patients in whom accelerated degenerative changes occurred due to aging. This observation was recently confirmed by biochemical studies undertaken by M. B. L. Craigmyle. Homogenous transplantation of cartilage can be performed easily with grafts obtained from tissue banks, thereby avoiding an additional operation on the patient. Homogenous transplantation of human tissue has become one of the most rapidly developing methods in experimental and clinical surgery. The successful homogenous transplantation of cornea, cartilage and osseous tissues has found immediate clinical use.

In Czechoslovakia, a tissue bank was established in Brno (1935). Between 1935 and 1957, homogenous cartilage grafts, preserved by freezing, were used at the Clinic of Plastic and Oral Surgery of the University of Brno 30 times in 27 patients with defects in the maxillofacial region.

Follow-up examinations were carried out periodically in all patients during the first year after

transplantation, and the results obtained were evaluated. From the second to the fifth year, the patients were examined once per year.

The results were excellent in 70 per cent of patients in whom the cartilage graft healed perfectly and served its purpose. In only four patients was the cartilage transplantation unsuccessful, the graft being rejected or absorbed during the first postoperative year.

Homogenous transplantation of cartilage is recommended in the repair of defects in the maxillofacial region whenever it becomes necessary to use a comparatively large graft. In such instances, the transplantation of supporting skin pedicle flaps is less suitable.

*Clinic of Plastic and Oral Surgery, Masaryk University, Brno, Czechoslovakia*

#### Transplantation of teeth and tooth germs

J. Komínek and O. Komínková. *Českoslov.stomat.* 58:372-384 Oct. 1958

Transplantation of teeth has in the course of centuries developed into a valuable treatment method, which, when conservative and surgical procedures fail, permits the saving of otherwise lost teeth.

In international dental literature, views on tooth transplantation or replantation appear to be divided in regard to the value and function of the periodontal membrane after transplantation of teeth or tooth germs. It has been proved, however, that the role of the periodontal membrane in transplantation is similar to that of periosteum in transplantation of bone grafts. The survival of a transplanted tooth is proportional to the amount of periodontal membrane maintained. A transplanted tooth without adequate periodontal membrane may obtain temporary fixation, but the result invariably is a substitution of the roots by osseous tissue which gradually leads to the ejection of the tooth.

Transplantation or transposition of fully developed, erupted or unerupted, teeth is not promising, although it can be attempted in isolated in-

stances. Tooth germ transplantation, however, appears to be more favorable. When the dental follicle and the pulp are preserved, it is frequently possible to re-establish the necessary blood supply and to keep the tooth germ vital.

Transplantation and replantation of teeth and tooth germs were performed in 57 patients at the Second Dental Clinic of the University of Prague, Czechoslovakia.

Autogenous and homogenous implantations of teeth and tooth germs in children and adolescents were completely successful in 17 patients (30 per cent), and fairly successful in 16 patients (28 per cent).

After the results of several years of clinical experience, the conclusion was reached that it is still too early to view optimistically the general use of tooth and tooth germ transplantation. Immediate replantation of teeth after accidental injuries, however, offers a more favorable prognosis. Autogenous transplantation of third molars is not only justified in most instances but offers a fairly favorable prognosis. Replantation of impacted deciduous cuspids obtains satisfactory results in about 50 per cent of instances.

Homogenous transplantation of teeth or tooth germs obtains less satisfactory results than autogenous transplantation. But even the comparatively small percentage of success (4.8 per cent) should be considered as significant because it proves that homogenous transplantation is feasible under certain favorable but as yet not fully determined conditions.

Attempts to insert tooth germs into surgically prepared (artificial) sockets, either by autogenous or homogenous transplantation, were unsuccessful.

It seems difficult to predict the success of transplantation or replantation of teeth or tooth germs because the biologic processes in the oral cavity are not fully understood. Biologic activities occur in the mouths of man and animal which cannot be compared to the phenomena of life observed in other parts of their bodies.

*Second Dental Clinic, University of Prague, Czechoslovakia*

Anesthesia  
and analgesia

**Promethazine as an adjunct to the treatment of the problem dental patient**

Alvin L. Solomon and Richard J. Lowell.  
*New York State D.J.* 24:348-353 Oct. 1958

Promethazine hydrochloride was administered orally as a preoperative medication to 53 dental patients, and intramuscularly during or at the termination of the operative procedure to 39 dental patients undergoing treatment with a general anesthetic. One hundred other dental patients did not receive promethazine and served as controls for this study.

Of the 53 patients who received promethazine preoperatively, 42 per cent of the patients became drowsy or partially asleep. Maintenance during the operative procedures was adequate in 48 patients (90 per cent). Seven of the 53 patients required additional thiopental sodium to insure the proper level of anesthesia. Preoperative nausea and vomiting occurred in nine patients (17 per cent) and postoperatively in eight patients (15 per cent).

Of the 39 patients who received promethazine during or at the termination of the operative procedure, vomiting occurred in 15 per cent. Postoperative drowsiness was noted in 62 (67 per cent) of the 92 patients who received promethazine; however, all the patients were sufficiently recovered to allow them to leave the office within 90 minutes. Seventy-two (78 per cent) were able to eat and retain food after arriving home, although many slept for varying lengths of time. During the first 24 postoperative hours, vomiting occurred in 4 per cent.

Of the 100 control patients who did not receive promethazine, retching or nausea occurred preoperatively in 24 patients (24 per cent). Postoperatively, nausea and vomiting occurred in 38 patients (38 per cent). Drowsiness also was evident in the control group, but all the patients

were able to answer simple questions before being released from the office, and 95 per cent were able to retain food on reaching home.

166-26 Eighty-ninth Avenue, Jamaica 32, N.Y.

**Micromethod for the estimation of anesthetics derived from aminobenzoic acid: procaine hydrochloride and tetracaine hydrochloride combined in cartridges for dental anesthesia**

Morris E. Auerbach and Murray M. Tuckerman.  
*J.Am.Pharm.A. (Sci.Ed.)* 48:194-196 March 1959

In 1957 Pratt reported a spectrophotometric titration with nitrous acid for the estimation of anesthetics derived from aminobenzoic acid. For the commercially available formula containing 20.0 mg. procaine hydrochloride and 1.5 mg. tetracaine hydrochloride, Pratt required a 20 ml. sample.

A micromethod is described for assaying anesthetics. The method requires only a 1 ml. sample of the same formulation. Since this formulation is packed in 2 ml. doses, the method allows the estimation of the anesthetics in the individual cartridges.

From a 1 ml. sample, the total anesthetic concentration is determined from the ultraviolet absorption of the extracted anesthetic bases in a strongly acid solution. The minor constituent, tetracaine hydrochloride, is determined by simultaneously diazotizing the procaine and nitrosating the tetracaine. A salt, soluble in water, is produced from the procaine diazonium chloride by coupling it quantitatively with Chicago acid (1-amino-8-naphthol-2,4-disodium sulfonate). The nitroso-tetracaine then is extracted from the alkaline medium with chloroform and determined spectrophotometrically.

In the assay of combinations of anesthetics derived from *p*-aminobenzoic acid and containing tetracaine, it should be noted that the chief chemical distinction between tetracaine and the anesthetics related to it is that tetracaine is a secondary aromatic amine, whereas the others are primary aromatic amines.

Sterling-Winthrop Research Institute, Rensselaer, N.Y.


 Fractures
**Diagnosis and management of facial fractures**

Frank D. Bernard and Gordon Davenport.  
*Surg.Clinics N.Am.* 38:959-968 Aug. 1958

Although diagnosis of soft tissue injuries of the face usually is easy, fractures of the underlying bones are less obvious and are easily missed. A displaced facial bone usually can be detected by palpation and a check of the dental occlusion.

A routine for examining facial bones should be established. The face first should be inspected for any bruised or swollen regions, which should invite suspicion immediately. Any asymmetry of the eyes, cheek bones or lower jaw usually indicates underlying injury. All regions of the face then are tested for numbness. Tender areas warrant attention. Next, the bony contour of the orbital margins is palpated. The malar prominences and zygomatic arches are compared. The palpating fingers are run down the nose. The maxilla is grasped within the mouth to determine any mobility. The dental occlusion is checked, and the patient is asked to open his mouth widely to demonstrate any limitation of motion, abnormal motion or undue discomfort. Any abnormality found during this phase of the examination probably indicates a fracture.

Any displacement of a part or all of the maxilla will change the position of the teeth and produce malocclusion. If the entire maxilla is displaced downward, the middle third of the face will be elongated; or a dish-faced appearance will be produced if the maxilla is displaced backward.

Occlusion is the key to detecting fractures of the mandible. Swelling, pain and tenderness also will point to the injured site. Fracture of the ascending ramus, and particularly of the neck of the condyloid process, sometimes is less evident. In such fractures, the height of the ascending ramus is shortened, causing the entire jaw to tilt upward on that side. This causes the teeth on the

injured side to meet prematurely, leaving a gap between the teeth on the opposite side. Because of the dysfunction of the injured joint, the mandible deviates toward the fractured side when the mouth is opened. Motion always produces pain in the joint. The diagnosis should be made as accurately as possible before roentgenograms are ordered. Reliance on roentgenograms alone for diagnosis should be discouraged because a number of facial fractures may be overlooked. On the other hand, even when the fractures seem obvious clinically, roentgenograms often will reveal unsuspected fractures, and are of great help in planning treatment.

Since Adams' classic paper in 1942, advocating internal wiring for the fixation of facial fractures, significant progress has been made in this field. Internal wire fixation provides much more dependable stabilization than do external appliances. The internal wires are buried beneath the skin, they are not seen and do not interfere with the patient's activities. Many patients can return to work soon after discharge from the hospital. Infection or other difficulties resulting from the wire are rare.

The achievement of normal occlusion is the criterion of adequate reduction of fractures of the upper or lower jaws.

110 East Main Street, Madison 3, Wis.

**Fracture-dislocation of the condyloid process in children**

L. Dessner and O. F. Holm.  
*Svensk tandläk. Tskr.* 51:57-68 Feb. 1958

Follow-up examinations of patients (children from 2 to 14 years old) with fracture-dislocations of the condyloid process were carried out at the dental clinic and the roentgenographic department of the Länslasarettet in Falköping, Sweden.

In all patients, the fracture-dislocations of the condyloid process had been treated conservatively, and the re-examinations were made from one to six years after completion of the treatment.

The combination of conservative surgery with orthodontic treatment resulted in obtaining complete function in all six instances investigated.

Complete anatomic healing occurred in all instances. Roentgenograms showed that the frac-

tured and dislocated condyloid process had regained normal mobility and a favorable relation to the glenoid fossa. Only in one instance was a hypoplastic change observed in the involved condyle.

Neither edge-to-edge bite nor open bite could be detected. There was no instance of jaw deformation or malocclusion.

Although the data collected during the follow-up examinations were limited, the treatment results obtained substantiate the conclusions of the authors that in fractures of the condyloid process, even if associated with gross displacement or dislocation, the combination of conservative surgery with orthodontic treatment should be the method of choice, especially in children. The prognosis seems to be favorable.

*Länslasarettet, Falköping, Sweden*

**Fracture of an upper left bicuspid allegedly caused by a blow to the right side of the jaw**

*Zahnärztl. Praxis* 9:233 Oct. 18, 1958

Q.—One of my patients claimed that he had suffered a fracture of his upper left bicuspid through a sudden blow to the right side of the jaw. This side, however, showed no symptoms, whereas a deep longitudinal fracture of his upper left bicuspid was evident. The fracture is located partly above and partly below the epithelial attachment, not exposing the pulp. Despite successful treatment and uneventful healing, the patient intends to sue his attacker. I expect, therefore, to be called on to give an expert opinion.

Is it possible or even probable that such a tooth fracture can be the result of a blow directed to and received by the opposite side of the jaw?

A.—Tooth fractures may be caused by direct and indirect factors. It is possible that fractures of left bicuspid or molars occur as the result of injury to the left side of the face. Several reports, describing such instances, have appeared in dental and medical literature. Car accidents, contact sport injuries, blows or falls traumatizing the chin frequently cause fractures of upper teeth without injuring the lower jaw. It is, therefore,

possible that the blow caused the tooth fracture described. Identical and similar cases were reported by Cloquet, Bérard, Leheribel, Schröder, and other authors. It can be assumed that at the moment of contact, the patient's teeth were not in occlusion (his mouth open), which may be a sign that the attack occurred suddenly and unexpectedly.

*13b München-Gräfelfing, Germany*

**Extraction of a tooth situated on the line of fracture**

A. I. Evdokimov. *Stomat., Moscow* 37:4:48 July-Aug. 1958

Some authors have recommended that any tooth situated on the line of a fracture of the jaw should be removed. In the Moscow Medical Stomatological Institute, both before and since the advent of antibiotics, the practice has been to leave such teeth in place unless there are contraindications such as persistent pain or inflammation not yielding to antibiotic therapy.

Of 968 fractures of the jaw, 314 showed a line of fracture through an alveolus at a level corresponding to one or another part of the root. Teeth were removed in only 43 patients (14 per cent) of this group. The sensitivity to electric stimulation of teeth left in place at a line of fracture often returns to normal and some teeth, not completely erupted at the time of fracture, have developed normally.

When such teeth are removed, a mixture of powdered sulfanilamide and penicillin is applied and the alveolus is packed loosely with iodoform gauze, an attempt being made to impregnate the gauze with blood to aid in the formation of a clot. The gauze is left in place for ten days. All patients are given two intramuscular injections of penicillin (200,000 units) every 24 hours for from seven to ten days.

Five case reports illustrate the treatment. The unconditional recommendation that any tooth situated in a line of fracture should be removed is mistaken.

*Moscow Medical Stomatological Institute, Moscow, U.S.S.R.*

## Oral surgery

**Myxomatous tumors of the jaws**

Donald C. Zimmerman and David C. Dahlin.  
*Oral Surg., Oral Med., & Oral Path.*  
 11:1069-1080 Oct. 1958

Twenty-six tumors of the jaw which were primarily myxomatous or fibromyxomatous (that is, composed of mucous tissue or of fibrous and mucous tissues) were seen at the Mayo Clinic from 1907 through 1956. Twenty of the 26 lesions were classed as benign and six as malignant.

The 20 patients whose lesions appeared histologically benign ranged in age from 13 to 64 years. The six patients whose lesions appeared malignant were aged 22 months, and 15, 16, 30, 47 and 61 years, respectively.

The tumors caused slowly progressive swelling of the affected jaw and, in some instances, severe facial deformity. Maxillary tumors often filled the antrum and caused exophthalmos. Frequently, teeth were displaced or tipped. The cortical bone was expanded and thinned. Slight pain was present in five patients. Trauma was associated in only two patients. Two of the six lesions classified as malignant had grown rapidly. In general, however, no clinical distinction could be made between the so-called malignant and benign tumors.

Of the benign lesions, ten were in female patients and ten in male patients. Ten were found in the maxilla and ten in the mandible. Of the six malignant lesions, four were in males and two in females; five were in the maxilla and one in the mandible. The six so-called malignant lesions were somewhat larger than the benign ones.

No roentgenographic distinction was found between the histologically benign and malignant lesions.

The treatment of the 20 benign lesions usually was curettage. The mass was enucleated, if possible, and the bony cavity was explored for residual tumor. In eight patients, electrocautery also

was applied to the base of the tumor or within the bony cavity; for three of the tumors, external irradiation and radium therapy also were added.

Five of the six so-called malignant tumors were treated by curettage and cautery plus irradiation. The remaining tumor, an encapsulated mass, was enucleated and the site cauterized.

The prognosis for the benign lesions is excellent in the sense that the patient's life is not jeopardized and no malignant changes in bony lesions of this type have been demonstrated. However, even the benign lesions are difficult to eradicate and, unless removed completely, recur rapidly.

Since myxomas are practically unknown in bones outside the jaw, and since they resemble portions of the dental follicle, they are likely odontogenic. Their histologic appearance correlates poorly with the capacity of myxomatous tumors of the jaw to recur.

*Mayo Foundation, Rochester, Minn.*

**Mechanical aids in the management of persistent trismus**

J. S. Knight and J. R. Moore. *Brit. J. Plast. Surg.*  
 11:340-353 Jan. 1959

Several types of mechanical aids have been found useful in treating patients who have difficulty in opening the mouth.

In the patient with ankylosis of the temporomandibular joint, the treatment is primarily surgical, but adequate postoperative care is essential to prevent relapse. In the patient with longstanding trismus, some form of fixed apparatus attached to cemented metal cap splints is preferable to a removable apparatus.

The most effective of the devices is the scissor apparatus attached to cap splints. The scissor apparatus is for use when sufficient teeth are present and considerable difficulty is anticipated. The amount of tension on the elastic scissor exerciser can be so regulated that it acts as both an opening device and an exerciser, antagonizing the muscles of mastication and encouraging their development after a long period of disuse. The scissor apparatus is best used in the hospital, because feeding is difficult. An oblique form of the scissor exerciser is used when the patient requires opening move-

ment combined with lateral traction. By varying the angle of the elastics between vertical and horizontal, any desired combination of opening and lateral movement may be obtained. Usually the angle of pull of the elastics is varied from about 30 degrees to 45 degrees to the vertical.

In the edentulous patient the most satisfactory apparatus is the sliding-tube type with Gunning splints, described by Kazanjian and Converse (1949).

A spring-type exerciser is for use when the initial opening has been obtained by other methods. The spring exerciser will further increase the opening, is an efficient exerciser, and can be used by the patient at home. The device incorporates a compression spring and a plunger which enables the tension to be varied. This apparatus, if used over a long period, tends to loosen the anterior teeth unless removable metal cap splints are fitted to distribute the pressure evenly between teeth and alveolar processes. Two springs in the vertical columns act through arms which articulate with the splints by ball-and-socket joints.

A useful opening apparatus is the acrylic trismus screw made of acrylic resin in pleasing colors. To assess the progress of treatment, some form of measurement is essential. A measuring device is used to measure the distance between the upper and lower incisors. The acrylic screw is recommended when the trismus is of relatively recent origin. The screw is made in various sizes and threads. It is inserted by the patient between the anterior teeth or the bicuspid and gradually turned to overcome resistance. This screw is an opening device and is not an exerciser.

The most rapid and the greatest improvement has been obtained with the scissor-type exerciser, especially when its use followed manipulation under general anesthesia. The sliding-tube exerciser has been used successfully to treat edentulous patients.

An acceptable degree of opening usually is achieved in ten days to three weeks, after which the scissor or sliding-tube exerciser may be left in place for a period in order to strengthen the muscles which have been idle for some time. When a change is made to a more convenient form of maintenance device, a sharp reduction in the range of opening usually occurs. In most instances, this opening then is maintained for a long

period. In only one of eight patients did the range of opening fall below 2 cm. measured between the anterior teeth or dentures.

277 Hagley Road, Edgbaston, Birmingham 16, England

#### **Treatment of trigeminal neuralgia with ether and adrenocortical hormone**

Melvin Coker. *Clin. Med.* 6:623-624 April 1959

An injection of ether into the trigeminal nerve at the point where its branches make their exits from the skull may give relief for months, and sometimes permanently, in trigeminal neuralgia. Ether is more effective than alcohol, since it is absorbed more quickly and is more destructive to nerve endings. Repeated injections of ether may be made; often, permanent relief is obtained when the liquid is deposited accurately into the nerve in the bone canal.

The exact location of the pain must be ascertained. Injections of butethamine hydrochloride are of value in locating the correct site of injection. The first injection should be 2.0 or 2.5 cc. If the injection gives relief temporarily, the correct site of injection for ether has been located. If the pain continues, other sites of injection should be tried until the origin of pain is found. This is done to prevent unnecessary injections of ether, as such injections are extremely painful for a few seconds and are accompanied by much swelling. The swelling can be disregarded.

All injections are made with a 28 gauge needle. Of the five practical sites for injection, three are in the maxillary bone and two in the mandible. For pain located near the nose and labial region, 1 to 2 cc. of ether is injected into the infraorbital canal with a 1½ inch needle. For more deeply seated pain in or around the superior dental nerves, the tuberosity injection is used; 2 cc. of ether is injected behind the zygomatic process with a 2 inch needle. For postnasal drainage, affected antrums and congested sinuses, the posterior palatine injection is used; 2 cc. of ether is injected with a 1½ inch needle. For pain located in the inferior and lingual dental nerve, 2 cc. of ether is injected into the mandibular foramen with a 1½ inch needle. The dental injection

is 1 cc. of ether injected into the dental foramen with a 1½ inch needle. If more depth of block is necessary, 2 cc. of ether is injected at the base of the first molar—extending on a right angle to the third molar. This method, used with care and discretion, should yield gratifying results.

Some patients with trigeminal neuralgia also are bothered with postnasal drainage, the pain being in or about the infraorbital region and localizing near the nose; 0.5 cc. of ether is injected extraorally, and deposited directly in the infraorbital canal. An adrenocortical hormone to be taken orally is prescribed, for replacement of hormone and reduction of inflammation.

Paris, Texas

### **Stabilization of surgical cement packs after frenectomy**

A. H. Bassmann. *Parodontol., Zürich* 12:167-170 Dec. 1958

Ordinary application of cement packs after frenectomy without assurance of adequate retention frequently constitutes a problem to both the dentist and the patient.

The dentist's obligation to protect the wound is the same as that of the surgeon after a major operation. Interproximal regions which are generally used for the retention of cement packs may vary according to the age of the patient and the position of the papillae.

In most instances, mechanical provision must be made to retain the cement pack for 7 to 14, sometimes even to 21, days.

The armamentarium consists of the following: (1) an ordinary broach holder; (2) 0.010 stainless steel wire (soft); (3) a pair of scissors; (4) a pair of crown and bridge pliers; (5) a surgical cement pack (A. M. Ward "Wonderpack"), and (6) an epinephrine chloride solution 1:1,000.

The wiring for the stabilization of the cement pack is placed prior to the root scaling and the surgical repair of the abnormal frenum. The pack and the wiring of the selected teeth should be extended beyond the horizontal incision. The two teeth positioned behind the incision, therefore, should be selected for the ligature.

The free end of a piece of wire (from 3 to 4 inches long) is inserted through the interproximal

space distal to the selected teeth and drawn linguallly. The direction then is reversed and the wire passed through the interproximal space mesial to the teeth, thereby looping the lingual tooth surfaces. Both ends are brought together and locked in the broach holder. The broach holder is turned clockwise until firm encirclement at the gingival border of the tooth is accomplished.

The two free ends are grasped, by either the broach holder or the crown and bridge pliers, and tied together, so that after ligation the wire is from 2 to 3 mm. away from the labial tooth surfaces. The terminal end of the wire is cut, leaving about 4 mm., which is bent downward or linguallly toward the interproximal space.

After root scaling and incision, a gauze pack saturated with the 1:1,000 epinephrine chloride solution is placed in the surgical region for approximately five minutes.

During this waiting period the surgical cement pack is mixed to the desired consistency. A few crystals of zinc acetate may be incorporated into the mixture, if acceleration of the setting time of the pack is required.

The gauze pack is removed and replaced by the surgical cement pack placed underneath the wire. The balance of the cement pack is guided carefully into the deepest portion of the surgical site and above the wire. This is best accomplished by lip manipulation. The wire always should be completely encased within the cement pack to insure firm retention. The patient is advised not to talk until the cement pack is completely set.

The cement pack should remain in position for three to four weeks. After that time the ligature should be exchanged and a new cement pack inserted.

The cement pack is removed by cutting the wire on the lingual tooth surface with either a pair of scissors or a knife. The pack is gently lifted away from the teeth and the tissues. Careful cleaning of the surgical site should be done with a hydrogen peroxide solution or a mouth rinse prior to the placement of each subsequent cement pack.

Clinical experience proved that retaining the pack for 21 days is an almost ideal period to permit nature to initiate normal epithelization of the incised region.

411 East Mason Street, Milwaukee 2, Wis.



### **Epidemiology [of cancer]**

*Cancer Bul.* 10:107-109 Nov.-Dec. 1958

Epidemiological study of cancer distribution ultimately may delineate the causative factors or the preventive measures. At least, directions for future study can be discovered by this means.

V. R. Klanolkar, in a report from the Tata Memorial Hospital, Bombay, to the recent Seventh International Cancer Congress in London, commented on the frequency of occurrence of oral and pharyngeal cancer. In this hospital's first 16 years of operation, more than 36,000 cancer patients were seen, 16,565 of whom had lesions in the mouth or throat. The most common locations were the base of the tongue and the hypopharynx, with the buccal mucosa next. Regional prevalence, tobacco usage, pigmentation, vitamin deficiencies, and habits of chewing betel leaves and nuts were measured and recorded. Also considered were such variables as racial incidence and religious practices.

J. N. P. Davies, in a study of jaw tumors in African natives from Uganda, reported 120 bone tumors between 1952 and 1957. Of these, 86 occurred in the jaw, a conspicuously disproportionate incidence. The lesions were of two principal types: adamantinomas, which develop in patients over the age of 16 years, and multicentric sarcomatous lesions, all of which occurred in patients between the ages of 30 months and 14 years. The latter type is highly malignant and involves both maxilla and mandible but not the buccal epithelium. At onset, the clinical manifestations of all these lesions are alike. First there is jaw pain. The teeth begin to "extend," then to skew, and then to fall out, with resultant infection of the sockets. The course of disease is alarmingly rapid. The dental effects are evident in as short a time as eight days, and there are demonstrable changes every 24 hours. The children have no

alterations in urine or blood, and the lesions are not all of dental origin. These tumors are a clinical entity which has been classified tentatively as multicentric reticulosarcoma. As all the patients were African natives, and from a restricted geographic area, the possibility of a local carcinogen must be considered.

In efforts to control a disorder that kills 3,000,000 individuals each year, every kind of research is required. Cancer control programs and tumor registries daily delineate new or additional facets of the universal problem.

*Hospital and Tumor Institute, University of Texas, 6723 Bertner Drive, Houston, Texas*

### **Ectopic mixed salivary tumours of lips**

K. D. Sharma, J. B. Shrivastav  
and S. Agrawal. *Am.J.Surg.* 96:506-510  
Oct. 1958

Of 50 mixed tumors of the salivary glands studied at the Medical College, Nagpur, India, over a period of seven years, six (12 per cent) occurred on the lips. The tumors ranged in size from 2 to 4.2 cm. in the largest diameter. The sectioned surfaces were homogenous and greyish white. Some areas were semitranslucent and tinged a bluish color. In one patient the tumor was almost entirely cartilaginous. Microscopically, the six ectopic tumors were composed of both the epithelial and connective tissue elements. The epithelial masses were arranged in broad strips and columns, or in a network of strands made up of these cells. Well-formed tubular structures were common.

The age of patients varied from 12 to 30 years, with an average age of 23.5 years. Four of the patients were male and two were female.

The origin of mixed salivary tumors from the epithelium is now a well-accepted fact. Although most authors agree that these tumors arise from adult glandular epithelium in salivary glands, the theory of origin from embryonic resting cells cannot be dismissed summarily. The occurrence of these tumors at the sites of fusion and folding in the complex embryonic development of the face is favorable evidence in support of this latter concept. Mixed tumors are much more common in the upper than in the lower lip. This disparity in

frequency can be explained by the more complex embryologic development of the upper lip.

In this series, the six tumors in no way differed histologically from those occurring in salivary glands. Pseudocartilaginous structures were noted in two of the six tumors. Squamous metaplasia of the epithelium also was present in two of the six tumors. One of the six tumors could be classified as mucoepidermoid.

*Medical College, Nagpur, Bombay State, India*

### Early diagnosis of oral cancer

T. R. Van Dellen. *Chicago Tribune* 117:24 Sept. 29, 1958

The majority of instances of malignant tumors of the throat and tongue can be cured, provided they are recognized early. But cellular tumors of these types, usually associated with metastases, are treacherous because they may smolder for months before causing symptoms.

The patient, a 60 year old artist, developed a sore throat and immediately consulted his physician. Clinical examination revealed that the throat was inflamed, the tonsils enlarged and the salivary glands swollen. An appropriate remedy was prescribed.

When pain failed to disappear at the end of a week, the patient returned to his physician, who examined the oral cavity again and noted that the right tonsil was extremely firm. Malignancy was suspected and the patient was referred to a specialist. He found a tumor involving the tongue, throat, and right tonsil.

It was judged that the patient's life could be saved by an immediate operation followed by roentgenotherapy. Plastic surgery was performed to restore the original facial features after healing occurred. This comparatively large tumor had existed for many months before symptoms developed. Some dentists or physicians might have allowed the condition to go on for another month or two, provided discomfort was not severe. To delay is human but it may mean for the patient the difference between life and death.

Another patient, a 77 year old man, walked into the office of an English dentist, carrying his dentures in his hands and complaining that the gingiva of the right side of his lower jaw was in-

flamed and caused pain. A mouthwash was prescribed.

Ten days later the pain was gone, and the dentist didn't think it necessary to examine the old man's mouth again. Three months later, however, the patient returned with the same complaint. A malignant tumor of the lower gingiva, involving the tongue, was discovered. Healing occurred after roentgenotherapy.

There are many variations of this story but the lesson for dentist and physician is the same. Malignant tumors of the oral cavity appear in simple disguises. Ill-fitting dentures are not the only cause of pain in the mouth—and in the instance discussed they were only coincidental.

Cancer consciousness is the only way to overcome the problem.

*435 North Michigan Ave., Chicago 11, Ill.*

### Adamantinoma jaw

S. P. Srivastava and K. C. Sikroria.  
*Indian J. Surg.* 20:323-333 Aug. 1958

The authors observed 17 persons with adamantinoma of the jaw. The youngest was 15 months old, and evidence of the tumor first was observed when this infant was 5 months old. The oldest patient was 36 years old. Eleven of the 17 patients were below the age of 20. The duration of the tumor varied from two and a half months to six years. Almost all of the patients came from the middle or lower classes. The maxilla was involved in three patients, and the mandible in 14. The teeth of the affected jaw were missing, loose or displaced in all 17 patients; ulceration, secondary infection, purulent discharge and pain were present in nine patients. The diagnosis of adamantinoma could be made roentgenographically in only six patients; in the other patients the tumor had been diagnosed mistakenly as osteoclastoma, dentigerous cyst or dental cyst. Roentgenograms showed in three patients an unerupted tooth in the cystic cavity, and in one patient the roots of the teeth projected into the cavity.

Three patients gave a history of previous operation. Partial resection of the mandible was performed on one patient, and hemimandibulectomy on five patients. Resection of the maxilla with suprahyoid dissection of the lymph nodes

was performed on one patient. Curettage was performed on six patients, all of whom had cysts. In four patients the lesion was too advanced for operation, and palliative deep roentgenotherapy was given.

Pain appears to be only a secondary symptom in adamantinoma, and the majority of the patients seek medical aid only because of an increased swelling. In instances of neglect, the growth ulcerates and bleeding occurs.

Adamantinoma should be considered a malignant tumor and should be treated by resection. Roentgenotherapy has no curative value, although it may reduce the size of the malignant growth. There is no conclusive evidence that the solid type of adamantinoma is more malignant than the cystic type.

*Sarojini Naidu Hospital, Agra, India*

#### **Osteogenic sarcoma of the jaws and facial bones**

Lyle V. Kragh, David C. Dahlin and  
John B. Erich. *Am. J. Surg.* 96:496-505 Oct. 1958

Although an unfavorable prognosis for osteogenic sarcoma of the jaws or facial bones commonly has been asserted, a study of the 44 case reports in the files of the Mayo Clinic, Rochester, Minn., gives a more optimistic view regarding results of treatment of these tumors. Nineteen of the 44 tumors in the present series arose in the mandible, 14 in the maxilla and 2 in the ethmoid region. The remaining nine tumors arose either primarily in the walls of the antrum, or primarily in the main portion of the maxilla and secondarily invaded the antrum. Twenty-four of the sarcomas were on the right side, 18 on the left, and two in the midline. Twenty-five of the patients were male, and 19 were female. The average age of the patients was 33.2 years, with the extremes being 11 and 62 years.

All but 1 of the 19 mandibular tumors consisted of a mass, varying from a diffuse swelling over the involved region to a firm localized or even bony hard mass. Eight of the 19 patients complained of pain, and five of numbness of the chin and lip.

Twelve of the 14 tumors that arose in the upper jaw, its alveoli or the palate produced a

mass discernible to the patient, and four of the tumors produced pain.

Of the nine patients with predominantly antral involvement, seven had noted a mass or swelling of the cheek, and five had pain.

Roentgenographically, the classic zones of destruction with or without regions of increased density were found in most of the 44 patients studied.

When the tumors were graded 1 to 4, according to the method of Broders, 3 were grade 1, 23 were grade 2, 16 were grade 3, and 2 were grade 4 (the least differentiated type).

The initial treatment given elsewhere to many of these patients was inadequate. Much of the early therapy was based on erroneous diagnosis, often diagnosis of a benign condition. Prior to establishment of the correct diagnosis, many of the patients had undergone dental and minor surgical procedures.

It is at the first operation that the surgeon has the best opportunity to effect a cure. More alertness on the part of dentists and physicians would favor earlier correct diagnosis and treatment of osteogenic sarcoma of the jaw. A relatively painless, nonulcerating mass occurring in the upper or lower jaw, particularly about the alveolus, should suggest the possibility of osteogenic sarcoma. In the antral and ethmoid regions, early symptoms are lacking.

The prognosis is surprisingly good, in spite of the frequent delay in proper therapy. Eleven of the 35 patients eligible for follow-up are known to have lived for more than five years. Several of the cured patients were initially treated by limited surgical means, but subsequently more radical treatment was successful. No patient treated by radiation alone survived five years. Adequate therapy requires total removal of the neoplasm, getting well into normal, uninvolved bone and soft tissues. This often requires such radical operative procedures as hemimandibulectomy or radical resection of the maxilla. The capacity of these tumors to recur locally makes it important to avoid breaking into the tumor during its removal. Prophylactic dissection of nodes probably is contraindicated because of the well-known rarity of lymphogenous metastasis by osteogenic sarcoma.

*Mayo Clinic, Rochester, Minn.*


 Case reports

### Hypersensitiveness to tooth paste simulating reaction to dental plate

Gösta Krook. *Acta odont.scandinav.* 16:259-265  
Oct. 1958 [in English]

A 60 year old woman had worn upper and lower dentures for more than 30 years. Her first dentures had been made of vulcanite, but three years ago she had been provided with acrylic dentures. After two years she complained of an increasingly severe burning sensation in the mouth. The oral mucosa became inflamed and reddened where it was in contact with the dentures. When these symptoms had been present for several months, the lips also became swollen and reddened. At times the patient felt a general soreness in the mouth which was intensified by eating and drinking. Tenderness was most severe in the hard palate.

For many years she had used various brands of tooth paste, but, like the physicians she had consulted, the patient believed that the dentures were responsible for her distress. As allergy to the acrylic denture material was suspected, she was admitted to a skin clinic for investigation.

Skin tests were made with finely ground substance from the patient's dentures and with the three brands of tooth paste she had most recently used. The patches were left on the skin for 48 hours. The ground denture material evoked no reaction. One of the tooth pastes (Stomatol) produced erythema and papules.

When the patient ceased to use Stomatol tooth paste, the oral condition subsided. After seven days the erythema and edema had disappeared from the oral mucosa and lips, and the patient was free from discomfort.

An exposure test was made. The dentures were brushed with Stomatol in the morning and evening, as had been the patient's custom. Five minutes after the brushed dentures were inserted in the morning, the patient complained of a burning

sensation in the tip of the tongue and the inner surface of the lower lip. In the evening of the same day—about an hour after brushing the dentures with the tooth paste—she reported "burning" around the mouth. Twenty-four hours later, the tongue was edematous and red. The buccal mucosa and the surfaces of the maxilla in contact with the denture were erythematous. The lips showed intense erythema and edema with the beginning of desquamation and a tendency to rhagades.

Analogous patch tests with Stomatol tooth paste were made on 12 healthy controls. Four reacted with erythema but none with papules. Eleven other control subjects with upper and lower dentures brushed their dentures with Stomatol twice daily for from one to three weeks. None showed any mucosal reaction or complained of oral discomfort.

The mucosal reactions in the first patient were not produced by toxic action but were a manifestation of contact allergy. Such relatively rare sensitization by contact between an allergen and the mucosa is analogous to the much more common sensitization by contact between an allergen and the skin.

*Skin Clinic, Holtermanska sjukhuset, Gothenburg, Sweden*

### Positional vertigo

*J.A.M.A.* 169:161 Jan. 3, 1959

**Q.**—A patient has a chronic back problem primarily on the basis of strain. He states that after he puts in his dentures he is troubled with sore throat, excess salivation and a feeling of fullness in the throat and ears. This is followed by a period of feeling off balance, and sometimes he can partially remedy this by either taking off his glasses or tilting them at unusual angles. He has rhagades despite vitamin therapy. There are no related findings in the pharynx or the mouth. Although this may be a psychosomatic disease, could there be some basic etiology?

**A.**—This is such a weird combination of symptoms (and tricks for their relief) that the problem can hardly be other than of psychological origin. This becomes even more likely if the disorder has been present for a long time. . . .

A.—This man's chronic backache may have overtones in the unpleasant symptoms affecting his ear, nose and throat. A feeling of fullness in the throat is closely akin to a lump in the throat, which is often purely hysterical. The excess salivation may be an attempt of the body to reject the unpleasantness of artificial dentures. This consultant has had two such patients in the past five years, treated mostly with placebos since all allergy tests, roentgenograms and local medication and treatment were of little value. The new, plastic type of dentures were changed to the old-fashioned rubber type of compound, with some improvement.

Mild positional vertigo may be caused or improved by slight changes—often sudden, minute movements of the head. Recent work indicates the possibility of an acid-base change in such persons, which often causes bizarre symptoms in the nose and throat, with an overlay of vertigo. Sodium thiosulfate in a 10 per cent concentration, 20 drops in water given three or four times a day, may be of value in such patients; if not, after a week or so, this should be changed to treatment with normal butyl alcohol, 7.5 per cent in water, 15 to 20 drops being given three or four times a day.

535 North Dearborn Street, Chicago 10, Ill.

#### **Transposition of a maxillary central and lateral incisor**

Kendall Porter. *J. Missouri D.A.* 38:9-11 Dec. 1958

A 21 year old patient desired an immediate denture. Only five maxillary teeth remained, four incisors and the left cuspid. Examination revealed that whereas the maxillary left incisors were normal in form and anatomic order, the maxillary right central incisor occupied the normal position of the right lateral incisor. The form of the right central incisor was normal. In the normal site of the central incisor was a malformed tooth which greatly resembled a maxillary right lateral incisor.

The patient was vague about the condition. At the age of nine or ten years he had fallen from a tree and knocked out a tooth in the right maxillary region. Shortly thereafter, another tooth had

erupted. Since that time, the teeth had appeared as they did at the time of examination. The patient gave no history of any extraction of supernumerary teeth or of any teeth in the anterior maxillary region.

The teeth were extracted and the denture inserted. Examination of the extracted teeth showed that the central incisors were mates. The left lateral incisor appeared normal whereas the right lateral incisor had a shortened root and the crown was twisted; on the labial surface was a concave groove. Depressions were present on the mesial and distal surfaces in the cervical region, and the anatomic crown was longer than normal. In spite of such malformation, the tooth appeared to be a maxillary right lateral incisor. It was concluded that this was an instance of transposition of the central and lateral incisors.

At the time of the total luxation of the tooth in the region involved, it is presumed that a deciduous tooth was lost. This injury may have had some effect on the form of the tooth which replaced the lost tooth.

1650 Neil Avenue, Columbus, Ohio

#### **Reticular lymphosarcoma of the marrow of the lower jaw**

Raul Mena Serra, Gaston Comas and Osvaldo Costa. *Arch. Cuban. cancer.* 17:62-65 Aug. 1958

A malignant osteolytic tumor of the marrow of the lower jaw occurred in a 6 year old Cuban boy. The tumor showed rapid growth and extreme sensitiveness to roentgenotherapy.

Microscopic studies revealed that the tumorous mass was formed by stem and undifferentiated cells resembling those observed in reticular lymphosarcoma of the lymph nodes. In some regions metastatic tumor cells appeared in the blood vessels.

Histopathologic examination revealed that the tumor originated from the lymphatic tissue by proliferation of atypical lymphocytes formed in the marrow of the lower jaw but showing no tendency to invade neighboring regions.

The tumor was diagnosed as a lymphoid reticular lymphosarcoma.

Calle 21, Vedado, Havana, Cuba

## Therapeutics

### Growth hormone and thyroxine: effects on submaxillary gland of hypophysectomized rat

David Bixler, Joseph C. Muhler and William G. Shafer. *Proc.Soc.Exper.Biol.& Med.* 100:323-324 Feb. 1959

The submaxillary glands of hypophysectomized male albino rats injected with growth hormone and sodium thyroxine, alone and in combination, were studied for their histologic and enzymatic effects.

Growth hormone and thyroxine separately were only partially effective in preventing hypophysectomy-induced enzymatic and histologic changes in the submaxillary gland. When administered together, however, the two hormones maintained normal histologic and enzymatic activity.

These results are comparable to those previously reported utilizing testosterone and thyroxine in combination. Apparently, the stimulatory action of thyroxine on the submaxillary gland function may be enhanced by the simultaneous administration of either testosterone or growth hormone, both of which are deficient in the hypophysectomized animal.

*School of Dentistry, Indiana University, Indianapolis, Ind.*

### Drug control of the dental salivary problem

Donald H. Masters. *Oral Surg., Oral Med. & Oral Path.* 12:229-233 Feb. 1959

A clinical study was made to evaluate the effectiveness of levo-hyoscyamine (Bellafofine) as a dental antisialagogue. In two years of active dental practice, more than 1,500 doses of levo-hyoscyamine were administered, and notes were kept on the degree of salivation, body type

(whether small, medium or large) and time lapse from the administration of levo-hyoscyamine to the point where the operator no longer noticed a moisture problem.

Where indicated, pentobarbital was employed to alleviate central excitation and to potentiate the anticholinergic (including the drying) effect. The dosage of pentobarbital varied from 0.75 grains in mildly excited persons to 1.5 grains in highly nervous patients. Most patients in this study were premedicated, as described, for periodontal surgical procedures or other related operations. In many instances, a local anesthetic also was employed. Also evaluated was Elixir Belladonal, a liquid form of levo-hyoscyamine and phenobarbital. The results with this form were good, but phenobarbital's onset of action is too slow and its duration of effect too long for the average dental procedure.

Larger patients usually needed more levo-hyoscyamine than smaller patients. Otherwise, the main factor that determined the dosage was the degree of salivation. If the degree of salivation was estimated (visually) to be light, 0.25 mg. of levo-hyoscyamine was given one hour before operation; if medium, 0.50 mg. was given one hour before the dental appointment; if heavy, 0.25 mg. was given four to six hours before the appointment and 0.50 mg. was given one hour before the appointment. The tablet may be ingested orally or absorbed sublingually.

Results were judged to be good (adequate reduction of salivary flow to produce a desirable operative field) in 70 per cent of the patients. They were judged fair (a slight reduction in salivary flow but a noticeable flow still present) in 20 per cent, and poor (no reduction in salivary flow) in 10 per cent of the patients.

No side effects that could be attributed to levo-hyoscyamine alone were noted. A slight variation in the duration of action of the drug was observed. It should be noted that any drug (such as levo-hyoscyamine) which contains belladonna is contraindicated in patients with severe glaucoma.

Every phase of dentistry is benefited by control of the patient's salivary flow. Levo-hyoscyamine is a good salivary inhibitor, is easy to administer and produces no discernible clinical side effects.

*1616 San Pedro, San Antonio, Texas*

### Topical application of tetracyclines in dental practice

M. Škach, A. Michněvičová, M. Dohnal and V. Vlček. *Časop.lék.česk.* 98:179-182 Feb. 1959.

At present, the topical application of antibiotics plays only a limited role in dental practice. The previously demonstrated high bactericidal effect of the antibiotics of the tetracycline group combined with their low toxicity induced the staff of the Second Stomatologic Clinic of the University of Prague, Czechoslovakia, to investigate the possibility of topically applied tetracyclines for the treatment of patients with herpetic stomatitis, herpes labialis, Vincent's stomatitis, cellulitis and oral infections caused by gram-positive and gram-negative bacteria or certain viruses.

The following conclusions were reached:

1. The favorable influence of tetracycline, chlortetracycline and oxytetracycline, topically applied, on the healing of lesions in the oral mucosa (caused by various types of microorganisms) is produced by a combination of antimicrobial and astringent actions. These effects were best demonstrated in the treatment of secondary infections which prevented healing and caused pain.

2. The disadvantages of topical application, especially the potential danger of sensitizing the patients and the production of inflammatory oral lesions, and not the occasionally observed side effects such as nausea or irritation of the gastrointestinal tract, prevent the recommendation of topical application of tetracyclines for general use in dental practice. Their use must be considered only as an adjunctive aid in the treatment of patients with oral infections caused by resistant bacteria or with severe inflammatory changes in the oral tissues. The decision as to whether to use the antibiotics of the tetracycline group topically rests with the dental practitioner and should be based on his experience, biological knowledge and sense of responsibility.

Second Stomatologic Clinic, University of Prague, Czechoslovakia

### Antibiotic lozenges

Mervin C. Myerson. *J.A.M.A.* 169:1235 March 14, 1959

In the past few years, a fairly large number of patients have complained of severe sore throat after using antibiotic lozenges. This was due to infection caused by *Candida albicans*. In all of these patients, the soft palate and pharynx were extremely red. In some, there were small white patches indicating the presence of colonies of *C. albicans*. The pain is more severe in this condition than in that associated with any of the inflammatory diseases of the mouth and throat, including severe streptococcal infections. There have been instances of prolonged illness and even death from this cause.

The moral and legal right of the manufacturer to market a product so injurious to health and at times to life itself is questioned. About 25 different antibiotic lozenges are offered for sale on prescription or over the counter in the average pharmacy. Each such lozenge, regardless of the number used, can permit a *Candida* infection of the soft palate and pharynx to gain a foothold.

What can be done toward a discontinuance of the sale of all antibiotic lozenges?

[Following is an excerpt from an editorial entitled "Abuse of Antibiotic Lozenges" appearing in the same issue of the Journal of the American Medical Association: "Inadequate dosage and indiscriminate usage of topical antibiotic and sulfonamide compounds in the treatment of infectious diseases of the throat can breed resistant bacterial strains. Their promiscuous use is unwarranted in trivial infections; moreover, their use is limited from time to time by the development of allergic reactions, by the sensitiveness of patients to these agents, by the acquisition of antibiotic-resistance and sulfonamide-resistance states, and by their ability to mask symptoms occasionally. Finally, stomatitis has been traced to various antibiotics and sulfonamides present in a variety of lozenges, troches, pastilles, and medicated chewing gum."]

133 South Lasky Drive, Beverly Hills, Calif.


 Public health  
dentistry
**New Zealand social dental services**

J. B. Bibby. *Internat.D.J.* 8:385-387  
June 1958

Living standards are high in New Zealand, and so is the incidence of dental caries. In children, for example, the number of affected teeth per child is 2.2 at 2 years of age, 6.6 at 5 years and 10 at 14 years.

New Zealand's social dental services enjoy the support and cooperation of the dental profession, which today has about 1,000 members. The social dental services fall into three groups: public hospital dental service, armed forces dental service, and the National Dental Service.

Public hospital dental service was introduced in 1913 and was planned to provide dental treatment, free or at low fees, for persons with low incomes. This service has not developed satisfactorily. Today only five hospitals have dental departments with full-time dentists.

The armed forces dental service was inaugurated in 1914 and now is established on a permanent basis to provide free dental treatment to the regular members of the armed forces. The administration is controlled by the Director of Dental Services (navy, army, air) who has the rank of a dental officer (captain).

The National Dental Service, the major social dental service in New Zealand, is under the control of a dentist—the director of the division of dental hygiene of the Department of Health. This service provides free dental treatment for all children up to 16 years of age. It is organized in two sections—a school service for children up to 13.5 years old and an "adolescent service" for students from 13.5 to 16 years old.

The school dental service was inaugurated in 1919. All children on entering the lowest grade of any primary school—whether state, church or private school—may enroll at a school dental clinic. Parents must sign a form consenting to

dental treatment and agreeing to follow advice on the oral care of the child. Treatment is also available for preschool children 2.5 to 5 years of age.

A unique feature of the school dental service is that it is staffed by about 700 women who are school dental nurses; each has received two years of intensive, specialized dental training in special schools controlled by the Department of Health. A school dental nurse is licensed to work only for the Department of Health and under the direction of department dentists. School dental nurses work in school dental clinics built to a standard plan and situated in school grounds.

Each dental nurse is responsible for the dental care of about 500 children of preschool and primary school age. She may perform only such dental operations as the Department of Health authorizes. Her work includes prophylaxis; the filling of deciduous and permanent teeth with amalgam and silicate cement; pulp capping; the extraction of teeth under local anesthesia; the topical application of sodium fluoride, and dental health education. She is trained to recognize malocclusions and dental conditions beyond the scope of her treatment, and to refer these to private dentists for necessary attention under the Social Security Law.

The adolescent dental service is a continuation of the school dental service and was inaugurated in 1945 to provide free treatment for children from the time treatment ceases at the school dental clinic to the age of 16 years. The service is provided partly by department dentists who work in special clinics, but mainly by private dentists under a fee-for-service plan as provided for in Social Security legislation.

The chief features of the Social Security fee-for-service plan are:

1. The individual dentist contracts with the Minister of Health to provide treatment.
2. The patient has a free choice of dentists, and the dentist has a right to decline to accept a patient.
3. The dentist has freedom of professional judgment in carrying out an authorized range of treatment at a fixed scale of fees.
4. There is provision for treatments not specifically authorized but found necessary by the dentist.

5. The patient may be inspected by officers of the Department of Health.

The National Dental Service now provides regular dental care on a six-monthly re-examination basis to more than 490,000 children. This total comprises 38 per cent of all children in New Zealand 2.5 to 5 years old; 93.9 per cent of all children 5 to 13.5 year old, and 79.9 per cent of all children 13.5 to 16 years old.

*Division of Dental Hygiene, Department of Health, Wellington, New Zealand*

#### **The dentist and vocational rehabilitation**

Howard A. Rusk and Samuel S. Herman.

*J.D.Med.* 14:35-39 Jan. 1959

Dental care frequently is an essential element in rehabilitation of the handicapped. For maximum effectiveness, such care must be coordinated with the services of physicians, physical therapists, occupational therapists, nurses, social workers and vocational counselors. The program of vocational rehabilitation sponsored by state and federal governments is an important mechanism for achieving such coordination, and offers the dentist an opportunity to enlarge his role in a nationwide attack on prolonged disability.

The state-federal program of vocational rehabilitation is primarily concerned with those disabled persons who can become economically independent. The objective is to help rehabilitate physically and mentally impaired persons so that they may be placed in gainful employment.

Generally, the criteria for eligibility for rehabilitation are these: a person must have a disability which is a substantial handicap to employment; he must be of, or near, working age, and there must be a reasonable expectation that the service will render him fit to engage in remunerative employment.

Action to eliminate or reduce a handicap through medical services was first authorized by federal legislation in 1943. Physical restoration embraces such services as medical, surgical, psychiatric and dental treatments; hospitalization, nursing and clinic services; convalescent or nursing home care; drugs and prosthetic devices; physical, and occupational and medically directed speech or hearing therapy. Services to the client

are rendered by physicians, dentists, hospitals and other community facilities.

The Office of Vocational Rehabilitation, in establishing standards and criteria governing the provision of dental services, has worked closely with the dental profession. The American Dental Association's Council on Dental Health has co-operated with the Office in developing policies and guides for the use of state agencies.

Although dental defects may not in themselves result in inability to perform specific occupations, they may contribute directly to the severity of other conditions which are job handicaps.

Since dental services clearly are within the scope and purpose of the vocational rehabilitation program, the Office recommends that state agencies establish no restrictions as to type of service or maximum amounts that may be expended per case. It is not a function of the vocational rehabilitation program, however, to provide general dental care. In common with medical and related services, dental treatment is authorized only where it will have a direct and demonstrable effect on a client's employability.

In the last fiscal year, 74,320 handicapped persons were placed in remunerative employment suited to their capacities, and 18,584 additional persons were successfully rehabilitated but had not yet found employment. Today, at least 2,000,000 Americans, disabled because of disease, accident or congenital conditions, could be helped by vocational rehabilitation.

*New York University-Bellevue Medical Center, New York, N.Y.*

#### **Relation between postwar nutrition and increase in caries incidence in Australia**

P. W. Seith. *Méd. & Hyg.* 405:420

Sept. 10, 1958

The influence of nutritional factors on the incidence of dental caries in white and native children of South Australia was studied at the Faculty of Dentistry of the University of Adelaide, South Australia.

The caries frequency in deciduous teeth was determined by the def index, and that in permanent teeth by the DMF index. The postwar in-

crease in caries, especially in white children, already has reached such a high level that only 4 per cent show dentitions free of carious lesions.

The comparatively high consumption of sugar, sugar-containing foodstuffs and other easily fermentable carbohydrates appears to be the main factor responsible—directly or indirectly—for the increase in caries incidence now observed in almost all districts.

The Australian Public Health Service uses all available means of publicity such as radio, television, film and newspapers, to promote changing from the cariogenic diet to a noncariogenic diet, and to inform parents, children and teachers about the importance of oral hygiene. The present diet, more than adequate for body growth and development, is inadequate for preservation of the teeth.

Movable dental clinics, visiting even the remotest communities and districts, have been used to obtain and maintain a more healthy condition of the children's teeth and to prevent a further increase in the incidence of caries.

It cannot be assumed that the white children in Australia are especially susceptible to caries because rickets in Australia is hardly seen and the diet contains a high amount of milk, distributed by the public school system.

During the war the intake of sugar-containing foods was greatly reduced, and the caries incidence decreased. The postwar diet, rich in saccharides, produced a significant increase in caries, beginning in 1946. In most European countries, the same observation has been made.

The nutrition of Australian aborigines, however, has not changed significantly, since the Stone Age. Meat is cooked in ashes and the customary foodstuffs are vegetables, herbs, roots and cactus fruits; the only food containing sugar is the honey of wild bees. To digest such a diet, Australasians need strong and healthy teeth, and their masticatory forces are far greater than those of Caucasians. Attrition is frequently found reaching to the gingival tissues. Enamel and dentin are extremely hard; the roots are firmly surrounded by the alveolar bone and no instance of periodontal disease has been observed.

The number of full-blooded aborigines is rapidly decreasing. In 1947, there were still about 47,000 residing in or wandering through Western

Australia, the Northern Territories, North Queensland and South Australia. About half of these are nomadic, the remainder living in or near settlements. There are also about 29,000 half-caste natives who, except for 2,000 nomads, live in settlements.

Before the initial arrival of the Europeans, the native population of Australia numbered about 300,000.

The white population is predominantly of European ancestry and basically of British descent. A substantial natural increase and a heavy immigration produce a yearly increase of about 100,000. The death rate is extremely low; the expectation of life is 66.07 years for men and 70.63 for women.

The main facts revealed by the Adelaide study are as follows: (1) the incidence of caries among white school children is high and increasing steadily; (2) the incidence of caries among half-caste children, although comparatively low, is increasing rapidly, and (3) the incidence of caries among the full-blooded aborigine children remains low.

*Faculty of Dentistry, University of Adelaide, North Terrace, Adelaide, South Australia*

#### The case for a 'fibrous chew'

B. Cooke. *D.Mag. & Oral Topics*  
75:137-142, 168 Sept. 1958

The larger part of the civilized diet today is a structureless, chemically refined, deficient pabulum which, although providing easily available energy food for the oral microbes, starves them of other essential nutrients to stop their proliferation and attendant removal of oral debris. The lack of physical structure in food encourages anaerobic rather than aerobic degradation of the debris of the mouth, and limits the flow of protective secretions into the oral cavity.

That the toothbrush is of value in assisting the removal of debris cannot be doubted, but it is at best an inefficient instrument when one considers the physical and chemical nature of the civilized diet. A sane diet provides logical prophylaxis, but as such a diet is not available in civilized communities, it becomes necessary to design factors which will assist natural oral hy-

giene by providing physical structure sufficient to stimulate mastication in conjunction with a "nutrient medium" which will enable the oral microbes to use the carbohydrate debris without invading the dental tissues.

It seems likely that the nutrients of a fibrous chew should include amino acids, proteins, the ammonium ion, certain enzymes and vitamins, inorganic salts, and be largely colloidal.

There is good reason to believe that a fibrous chew could be obtained which would not only encourage beneficial mastication with its aeration of the bolus, but would supply adsorption factors for speeding enzymic and microbic activity and, by providing nutrients as described, would place the carbohydrate debris at a premium, thereby reducing the chance of microbic invasion of the dental tissues. In addition, the pH could be stabilized at any desired level.

A large firm making industrial filters agrees that it may be possible to work out a practical system for the removal of oral debris in the ways described. It has offered its laboratory facilities to demonstrate the practical nature of the scheme, provided experimental factors could be supplied for analysis and bacteriologic examination. Possible materials for a fibrous chew include asbestos, cellulose and activated charcoal.

*Health Centre, Blackborough Road East, Reigate, England*

**The dental problems of the physically handicapped and the mentally retarded child in Connecticut—and public health's role**

Leonard F. Menczer. *J. Connecticut D.A.* 32:6-11 Oct. 1958

Between 13,000,000 and 15,000,000 children and adults in the United States are so physically and mentally handicapped as to make it difficult for them to live normally and to obtain necessary dental and medical care. These handicapped individuals represent about 200 patients for each dentist in the United States. Although medicine has undertaken extensive research, medical care and medical programs for the handicapped, little has been done to meet the dental needs of these special groups.

The establishment of a dental clinical program for the handicapped should be a major goal of each component dental society. In recent years, dentists in Connecticut have become somewhat more aware of the needs of these special groups. In 1951, and again in 1952, a medicodental seminar on cerebral palsy was sponsored by the council on dental health of the Connecticut State Dental Society, at the Newington Home and Hospital for Crippled Children. In 1956, through the efforts of a group of local dentists, a dental clinic for handicapped children was initiated in Bridgeport. The council on dental health of the Hartford Dental Society and the Hartford Health Department are attempting, in a limited way, to meet the needs of the handicapped. Early in 1958 the New Haven Health Department sponsored a seminar for the dental profession on dental care for the mentally retarded and other physically handicapped children.

There is no standard technic by which a community establishes a dental program for handicapped children. One technic has been supplied by the United Cerebral Palsy Association in its publication entitled "A method of organizing a dental guidance council for cerebral palsy."

*Hartford Health Department, Hartford, Conn.*

**Dental health services for children**

*Chron.WHO* 12:341-343 Oct. 1958

A study group on dental health services for children, sponsored by the Belgian government and the WHO Regional Office for Europe, met in Brussels in February 1958 to make suggestions for the improvement of existing services in Europe and the development of new services.

In some urban European areas, large central clinics provide special treatment and routine dental care for children. In other urban areas, central clinics are reserved for special treatment, and routine dental care is given at small clinics in schools or health centers.

Children in rural areas can be provided dental care best through fixed or mobile clinics in or near school buildings. In both urban and rural areas, the services of the private dental practitioner are always valuable and often indispensable.

In countries with adequate financial resources and a sufficient number of dentists, dental health services for children should aim at providing—in addition to normal dental care—special care for the handicapped, the correction of malocclusion and treatment for children with cleft lip and cleft palate. The program also should cover pre-school children, expectant and nursing mothers, and should include preventive measures and dental health education.

Where staff and finances are limited, the program should concentrate on six year old children, after which should come older children, very young children, and expectant or nursing mothers, in that order. Priority should be given to preventive measures, the relief of pain and the removal of gross oral sepsis. Where possible, both general and specialized orthodontic service should be provided.

The diet of expectant or nursing mothers should be supplemented or fortified if it is unbalanced or lacking in some essential vitamins or trace elements.

In areas where public water supplies are deficient in fluorine, water fluoridation should be an essential part of preventive dentistry.

Known health education technics should be employed. An international coordinating group might assemble and distribute suitable educational material.

Private dental practitioners, as well as public dental officers, should participate in dental health education. To this end, postgraduate courses should be sponsored by dental groups, governmental agencies or educational bodies; information bulletins or newsletters should be issued by interested agencies, and workshops, seminars and study courses should be held on educational methods. Dental schools should pay more attention to instruction and training in dentistry for children.

WHO, Palais des Nations, Geneva, Switzerland

**The distribution and reactions of fluoride ions in enamel-saliva environment, investigated with the radioactive fluorine isotope  $F^{18}$**

Yngve Ericsson. *Acta odont.scandinav.*  
16:127-141 Aug. 1958

There is ample evidence that both the greatest uptake of fluorine by dental enamel and the best protection against caries are obtained when fluoride is administered during the period of enamel mineralization and pre-eruptive maturation. The posteruptive capacity of ionic uptake and exchange of the enamel is limited and mainly concentrated on the outer surface.

To obtain more precise information on the distribution and reactions of the fluoride ion, the radioactive fluorine isotope,  $F^{18}$ , was used for studies in an enamel-saliva environment in vitro.

In mixtures of saliva and sodium fluoride solutions, the dissolved fluoride was practically completely diffusible according to ultrafiltration experiments. The uptake of  $F^{18}$  from saliva by enamel surfaces was about three fourths of the uptake from comparable salt solutions, as also was the simultaneous uptake of  $P^{32}$  which was added as phosphate.

Zones of incipient carious dissolution took up much more  $F^{18}$  and  $P^{32}$  than did intact enamel surfaces of the same tooth.

The idea has been advanced that an increased fluoride uptake, and thereby an increased protection of the tooth, might be attained through electrophoresis, that is, by making the tooth electropositive to the fluoride solution.

Experiments in vitro designed to test this suggestion revealed that electrophoresis did not increase the uptake of  $F^{18}$  by the enamel of extracted teeth.

Royal College of Dentistry, Stockholm 3, Sweden

Anthropology

**No evidence of dental caries found in the teeth of Etruscan skulls**

Fritz Gordian. *Weltwoche* 26:7 July 11, 1958

Of the most ancient and important Etruscan cities, Vetulonia, Tarquinii, Vulci, Caere, Volaterra, Clusium, Arretium, Rusellae, Cortona, Perugia, Populonia, Veii and the recently discovered Spina, a great deal is known as the result of recent excavations.

Spina, which was situated at the mouth of the Po River, owed its importance to its proximity to the Adriatic Sea. The city probably existed a long time before the Etruscans arrived in Italy, and was buried, about 2,500 years ago, under dunes and marshlands. Giant pumps and steam shovels now remove, meter by meter, the slimy covering.

More than 1,000 Etruscan and a few Greek skulls have been unearthed, and were recently examined by an Italian team consisting of archeologists, roentgenologists and dental researchers. Preserved by the swampy grounds, the skulls have remained sealed airtight. The dentition in all Etruscan skulls examined was in excellent condition. Neither in the teeth of children nor in those of aged men and women was there any evidence of caries. It is not known if the Etruscans were aware of caries-preventive procedures, if they omitted cariogenic substances in their diet or if they had any knowledge of biochemistry. It is known only that the Etruscans as well as the ancient Greeks had prominent physicians who wrote and taught about the biologic functions of the human body.

Prejudiced by the myth of the greatness of modern sciences, present mankind is opposed to the idea that people more than 2,500 years ago should have known natural caries-preventive substances. The fact, however, is undeniable that the Etruscans of Spina did not experience caries.

This is in contrast to other ancient people, including prehistoric man of the Stone Age and the Iron Period. More than 40 per cent of teeth of these people had carious lesions.

The members of the scientific team were amazed by the uniformly gray discoloration all teeth exhibited. First, the scientists thought the factor causing this unique discoloration must be identical with the factor preventing caries development. They believed that the Etruscans practiced dental hygiene by using an unknown chemical substance which destroyed all harmful bacteria in the oral cavity and simultaneously caused the darkening of the tooth surfaces. This theory had to be abandoned, because near the excavated skeletons some ivory dies were found which showed a similar discoloration. It can be assumed, therefore, that chemical substances within the slimy covering caused the uniform change in color of all tooth and bone structures.

The teeth of the Etruscans probably had the same color as those of modern man. The secret of their resistance to dental caries remains unsolved.

*Talacker 41, Zurich, Switzerland*

**Exodontia among the Batonga**

James Ritchie. *Central African J. Med.* 4:250-251 June 1958

As a dental member of a team conducting a nutrition survey of the Batonga tribe of Southern Rhodesia, the author had an opportunity to observe a curious tribal custom in which the upper incisors and cuspids of girls were removed.

Chief Mola revealed that the girls of the tribe, on approaching the age of childbearing, were taken into the bush by certain old women and returned after six months without their upper anterior teeth. These teeth, he said, were re-

moved by being knocked out with a stone. The young men of the tribe used to be similarly mutilated, but the practice stopped after the Europeans arrived; the lack of anterior teeth proved to be a handicap in competing for jobs.

A former Zambesi chief confirmed Mola's story and added that the age of extraction for the girls was about 14 years. He gave a similar reason for discontinuance of the practice in boys.

One girl was seen with her upper incisors missing but the cuspids still in place. It was said that she became frightened halfway through the operation and escaped. The former chief said that girls can now refuse to have the extractions performed, but he was unable to produce girls with intact dentitions. The method of removal was described as knocking with a small hammer until the teeth can be removed with the fingers.

Shabi, another chief, described the method of extraction differently. He said that a small ax or arrowhead is knocked in the space between the central incisors until one tooth becomes loosened sufficiently for easy removal. The others are removed later with the same instrument.

Binga, the most cultured of the chiefs, said that he had decided to refuse to have the traditional tooth extractions performed on his daughters. He asserted that some of the old customs were dying out. A few young men, however, have their anterior teeth removed, but most boys realize that, since the Europeans and the Matabele tribe have intact dentitions, the old custom has many disadvantages.

At Siabuwa, one chief said that the custom of tooth extraction was now optional, and that a number of girls had chosen to retain their teeth.

No convincing explanation for the origin of the extraction custom was obtained. One story told was that the teeth were extracted to prevent women in childbirth from biting the baby. Another story was that in the distant past, a chief's wife had bitten him and that he had decreed that henceforth all women should have their upper teeth removed. The chiefs giving these answers were nonplused by the question: "Why, then, did

you do it to the males?"

Salisbury, Southern Rhodesia

### Injury to and rate of growth of an elephant tusk

Frank Colyer and A. E. Miles. *J. Mammal.*

38:243-247 May 1958

The tusks of elephants have their power of continuous growth and are socketed into the upper jaws. The socketed portion is almost vertical and the growing end is situated just below the floor of the nasal cavity. This portion of the tusk contains a funnel-shaped pulp cavity which in adult elephants reaches almost to the level of the margins of the bony socket.

The relatively superficial position of the thin-walled socketed portion of the tusk exposes this elongated, greatly enlarged incisor to injuries from bullets or spears aimed at the head.

Many elephants were found which showed the remarkable powers of the enormous pulp to recover from such injuries. Part of the left tusk of an African elephant (*Loxodonta africana*) remained in the jaw after the greater part was broken off. This lost portion was partially replaced by new growth added after the injury. It may be supposed that the greater part of the pulp in the lost tusk fragment became necrotic as a result of another injury but that the formative tissues in the opening of the funnel-shaped pulp cavity survived. At first a mass of unorganized dentin was formed, nearly filling the pulp cavity. Newly formed ivory joined the two portions. Subsequently the formative tissues recovered and were able to rebuild gradually parts of the lost fragment. The great recuperative power of the pulp of the elephant tusk was demonstrated thereby. The rate of posttraumatic growth in elephants corresponds with the rate of incisal growth observed in other animals.

Odontological Museum, Royal College of Surgeons of England, Lincoln's Inn Fields, London, England

History

**Hugo Carl Plaut (1858-1928)  
of 'Plaut-Vincent's angina'**

*M.Press* 240:993-994 Oct. 15, 1958

Hugo Carl Plaut, the son of a banker, was born at Leipzig a century ago, on October 12, 1858. He studied agriculture and political economy at Jena and Leipzig, graduating with a Doctor of Philosophy degree in 1882, and then became a medical student at Leipzig, Kiel, Paris and Vienna. Having obtained his medical degree in Leipzig in 1890, Plaut practiced in that city until 1897 when he moved to Hamburg. In 1913 he became director of the Institute of Mycology at the Eppendorf Hospital, and five years later was appointed professor of mycology. A mycologist of European reputation, his name is attached to the agar-trichophytin medium.

It was as a general practitioner at Leipzig that Plaut made the discovery for which he is best known, for in 1894 he described ulceromembranous angina (Vincent's infection, necrotizing ulcerative gingivitis). Henri Vincent published his classic paper two years later. Although there is little doubt that the clinical condition previously had been described by Filatov and others, the bacteriological aspects of the disease were first described by Plaut, not by Vincent.

A restless investigator, a tremendous worker and a pleasant personality with a great sense of humor, Plaut died in Hamburg on February 17, 1928, at the age of 70 years.

8 *Henrietta Street, Covent Garden, W.C.2, London, England*

**Early history of dentistry,  
especially of orthodontics: I**

L. Rinderer, *Schweiz.Mschr.Zahnk.* 69:21-23  
Jan. 1959

The practice of dentistry probably is as old as that of medicine. In antiquity both healing arts

were so interwoven that it now appears impossible to separate ancient dentistry from ancient medicine. Oral surgery and prosthetic dentistry, however, seem to have originated even earlier than scientific medicine.

The arts, sciences, dentistry and medicine in every country progressed (and are still progressing) in proportion to the cultural and civilizational level reached by the specific people. It is natural, therefore, that dentistry and medicine flourished first in ancient Egypt, Phoenicia and Greece.

In the Western world, Hippocrates (born about 460 B.C.) initiated the study of medicine, and in the so-called *Collection of Hippocrates* dental procedures are mentioned frequently. The *Oath of Hippocrates* still is often quoted and so is his perception: "The healing of disease is a science based on knowledge and experience which can be taught, but it is also an art which never can be mastered by studying."

After Hippocrates and his school, from Aristotle (384-322 B.C.) to Galen (second century), dentistry and especially dental anatomy made no perceivable progress.

Aulus Cornelius Celsus (first century), a Roman physician and medical writer, described ulcerations of the mouth (aphthae) and oral tumors (parulis). He recommended that carious teeth be filled with scraped linen or lead to prevent breaking under the pressure of the instrument used for extraction. He also described treatment methods for jaw fractures and dislocations and probably was the first to recommend procedures to correct tooth irregularities. He, therefore, can be regarded as the "Father of Orthodontics."

Caius Plinius Secundus (A.D. 23-79), called Pliny the Elder, recognized that occasionally children are born with erupted teeth. He cited as an example the Roman consul Marcus Curtius who allegedly was born with all deciduous teeth erupted and was called *Dentatus*.

Aetius of Amida, a Greek medical writer of the fifth century, advised that during teething, hard objects should not be given to the infants, because the gums would become callous and thereby render the cutting of the teeth extremely difficult.

Paul of Aegina (about A.D. 636) recommended immediate removal of supernumerary teeth because they may produce tooth irregularities and

malocclusion in the permanent dentition.

After the great migration of nations (*Völkerwanderung*), from the second to the fifth centuries, the Arabs replaced the Romans as the leaders of the world in medicine, dentistry and in most sciences.

Abulcasis (Abul-Casem-chalaf-ben-Abbas), who lived and practiced medicine around A.D. 1013, was one of the greatest surgeons of his time. His works greatly influenced Arabian and European medicine and dentistry. He discovered the adverse effects of dental calculus on the periodontal tissues and demanded that a thorough cleaning of the teeth should precede any other dental procedure. Among the many medical and dental instruments he described were specially constructed forceps to be used for elevating the tooth before extraction.

Ibn Sina (A.D. 980-1037), called Avicenna, an Arabian physician and philosopher, gave a detailed description of the anatomy, physiology and pathology of the teeth. He recommended the use of dentifrices containing hydrous magnesium silicate (*Meerschaum*), salt, burnt shells of snails and oysters, ammonium chloride and calcium sulfate dihydrate (plaster of paris,) for cleaning the teeth, massaging the gingivae and eliminating calculus.

Orthodontic Department, Dental Institute of the University of Zurich, Switzerland

### Early history of dentistry, especially of orthodontics: II

L. Rinderer. *Schweiz.Mschr.Zahnhk.* 69:23-33  
Jan. 1959

During the Renaissance (1435-1530), the newly created Italian universities promoted great advances in medicine but little attention was paid to dentistry.

Andreas Vesalius (1514-1564), however, deserves a place of honor in the history of dentistry. He reported in 1534 that he was successful in making the eruption of molars, especially of third molars, less difficult by cutting into the gingival tissue to expose the alveolar bone and by elevating its osseous plate. He also gave an almost accurate anatomic description of the tooth roots and the pulp chamber.

Peter Foreest (1522-1597), a Dutch physician, described three dental instruments, the forceps, pincers and pelicans. He stated that foodstuffs containing sugar are harmful to tooth structures. He described a procedure he performed on himself, in which he had elevated an aching and extremely mobile tooth, after an unsuccessful attempt to extract it, and after a short time the tooth became painless and firmly attached to its alveolus. According to Foreest, the tooth functioned adequately for five years. He also observed that inflammation of the gingival tissue and the entire oral mucosa occurred after insertion of artificial teeth which at that time were made of ivory and fixed to the adjacent teeth with gold wire.

Girolamo Fabricio of Aquapendente (1537-1619), called Fabricius, recommended the following seven dental procedures: (1) forcing the opening of the dental arches (probably in instances of trismus) to prevent the patient from dying of hunger; (2) eliminating calculus and promoting oral hygiene; (3) medicating carious lesions; (4) filling the cavities with gold leaf; (5) removing or resectioning the displaced and impacted teeth; (6) eliminating unevenness and sharpness of the teeth by filing, and (7) extracting all movable, painful and carious teeth which cannot be saved. For teeth difficult to extract he recommended coronal sectioning.

Johann Schultes (1595-1645), called Scultetus, a German physician, was the author of *Armentarium chirurgicum* in which descriptions and illustrations of almost all surgical instruments of that time were given, among them the following dental and oral-surgical instruments: (1) several types of pelicans, resembling the beaks of the pelican, used for extraction of molars; (2) commonly used forceps (*cagnolo*), resembling a dog's muzzle; (3) crow's beak forceps (*rostrum corvinum*) for eliminating tooth roots; (4) two types of forceps (*dentiduces*), for elimination of teeth which could not be extracted with pelicans or common dental forceps; (5) bifid and trifid elevators (*vectes bifidi et trifidi*) to be used for removal of incisors, cuspids and roots; (6) dental scalpels (*dentiscalpia*) for detaching the gingival tissue from the tooth or bone prior to extraction; (7) silver funnel or cannula (*infundibulum seu fistula argentaea*) for nourishing patients with

trismus; (8) parrot-beak forceps (*rostrum psittacinum et vulturinum*) for removal or resection of displaced teeth, and (9) screw dilators (*dilatatorium cum cochlea*) for gradually opening the dental arches in instances of spasmodic constriction of the jaws.

Anton Nuck (1650-1692), a Dutch surgeon and anatomist, devoted great attention to oral surgery and prosthetic dentistry. For removal of incisors, he recommended the "goat's foot" and warned against tooth extraction during pregnancy. He used a variety of remedies to arrest oral hemorrhage, such as tinder, burnt linen, sulfuric acid and cauterizing iron. He stated that files may be used without causing harm if the inner cavity of the tooth is not penetrated. He gave the prescription of a tooth powder consisting of pulverized cuttlefish, coral powder, cream of tartar and pulverized red roses.

After the Thirty Years' War (1618-1648), France became the leading country in medicine and dentistry. Pierre Dionis (1658-1718), Pierre Fauchard (1678-1761) and Jean Baptiste Verduc (about 1694) opened the way to modern dentistry and orthodontics. They were followed by many outstanding professional men such as Lorenz Heister (1683-1758), a German surgeon;

Claude Mouton (about 1786), a French prosthodontist; Bernard Bourdet (1732-1773) and Etienne Bourdet (1722-1789), French dentists; John Hunter (1728-1793), an English surgeon; Joseph Fox (1776-1816), an English surgeon and Hunter's most prominent pupil; C. F. Delabarre (1777-1862), a British dentist; Bartholomew Ruspini (1720-1797), an Italian dentist who practiced in London, and many others who contributed a great deal to the advances achieved by dentistry and orthodontics.

The importance and value of dental and orthodontic service to the general public are now well recognized, but the present generation of dentists is inclined to view the progress in dentistry and orthodontics from the standpoint of the twentieth century, thereby overlooking the immense work performed by their predecessors, a long line of gifted men reaching far back to the mists of antiquity. These men were responsible for laying the foundation on which modern dentistry and its various branches have been built.

In this brief history of dentistry, especially of orthodontics, no source has been used which was published less than 100 years ago.

*Orthodontic Department of the Dental Institute of the University of Zurich, Switzerland*



Practice  
administration

**Billing and collection**

Editorial. J.A.M.A. 168:2050-2052 Dec. 13, 1958

Income is what keeps professional men in practice. How can a practitioner guarantee that he will receive the greatest percentage of the fees he earns? Once again, the principles of good management apply: advance planning, an established routine and adherence to those procedures.

Here are three keys to maintaining a high collection ratio: (1) the practitioner should make certain that his patients understand the charges and appreciate that they are receiving professional service commensurate with the fee; (2) he should make it convenient for his patients to pay at the time of treatment, and (3) he should send his bills punctually and regularly, and follow up conscientiously on uncollected bills.

Advance fee discussion is the best means of assuring that the patients understand and accept their bills. Because most people subconsciously resent paying for unwanted and painful diseases, a certain amount of ethical "selling" of regaining and maintaining good health is advisable. The importance of reaching agreement and understanding about fees in advance of a long and costly treatment cannot be overemphasized. Every patient is entitled to know what fee to expect. He is buying service, and he wants to know approximately what it will cost, just as he wants to know how much a new suit of clothes will cost.

The best way to explain the fee charged is to itemize the bill. This has been standard practice in business for years, yet too frequently professional men send statements merely saying: "For professional services rendered." On the surface, an unitemized bill may appear to be excessive. The charge slip is a form which should be used more widely. This slip, usually in triplicate, lists the various types of service performed. The patient is given a charge slip when he enters the office. The procedures performed and the charges for them are entered on the slip after each visit,

and the patient returns the slip to the assistant's desk before he leaves. Most patients are prepared to pay for routine visits but often leave the office without paying because no one gave them the opportunity to do so. If most of the patients can be encouraged to pay as they go, expensive and time-consuming billing can be reduced.

The patient who pays before he leaves the office is given one of the charge slips as a receipt; the others serve as office records. When a patient prefers to be billed, the charge slip is used to prepare the itemized bill or a copy is enclosed with the statement.

Every practitioner wants to work out his own "collection timetable," but here is one which will work out satisfactorily: first month a statement is sent; second month, the statement is repeated; third month, a reminder note is written; fourth month, a personal letter is sent, and after the fifth month, a letter is written saying that because the patient had ignored all previous communications, the account ought to be turned over to a collection agency.

The personal approach is the best way to follow up collections. That is why stickers and other commercial reminder devices attached to statements are not effective in dental or medical practice. After two statements have been sent, a short but personal note should inquire whether the patient has overlooked the bill. The next letter should invite the patient to the office to discuss any special payment problems. Whatever kind of reminder is used, it should be informal and sincere and should imply confidence that the patient intends to pay. Phrases such as "I need the money" or "I have bills to pay, too," should be avoided.

There are two prevailing points of view on the question of whether to reduce or cancel a bill entirely if a hardship becomes evident. One idea is that the bill should be reduced but not canceled in order to save the patient's pride. The other idea is that the bill should never be reduced but occasionally a fee should be canceled; this idea evolves from the belief that a professional man should never bargain for his services. The decision whether to reduce or cancel a fee in hardship cases rests with the personal feeling of the practitioner.

535 North Dearborn Street, Chicago 10, Ill.

Dentistry  
around the world

**Notes on dentistry in Denmark**

Don W. Gullett. *J.Canad.D.A.* 24:654-658  
Nov. 1958

With a population of 4,500,000 persons, Denmark has 2,300 dentists, of whom 30 per cent are women, for a dentist-population ratio of 1:1,906.

There are about 1,575 sick benefit societies in Denmark which, since 1891, have received state support. In 1933 a National Health Insurance Act was passed establishing regulations governing these societies. Everyone who has attained the age of 21 years is legally obligated to register as a contributing or passive member of a sick benefit society. Benefits conform to government regulations, but may vary from society to society. In 1957, about 20 per cent of the total cost of health benefits was covered by membership fees and 80 per cent came from government subsidies derived from the income tax.

The Danish scheme for dental services is complicated. Some sick benefit societies provide only extractions and others provide complete conservative dental service, but none provides gold restorations or prosthetic dentistry as benefits. Children under 18 years old are not included for dental services by the societies, because children are served by the school dental service. The benefit services, as well as those not provided by the scheme, are rendered under private practice conditions. The patient pays fees directly to the dentist for nonbenefit services.

Every dental graduate by law must serve with another dentist as an assistant for two years before being granted a license to practice independently. The result is that the new graduates perform much of the dental benefit services, whereas the dentist owning the practice performs those services not included as benefits, on a private practice fee basis. Dental services under the sickness benefit arrangements are performed in private dental offices. At one time some of the

benefit societies had clinics, but the dental association opposed them and they were eliminated. Payment to the dentist under the scheme is by means of a fixed fee schedule.

Government dental services are provided in social institutions. Each community is allowed to institute a school dental service. About a third of the dentists working under this service are full-time employees. Complete dental service, except for orthodontic service in some communities, is provided for children. In welfare institutions and the school service, dentists are paid from 24,000 to 27,000 kroner a year (about \$3,500 to \$3,850). The average dentist in private practice has a net income of between 40,000 and 50,000 kroner (about \$5,714 to \$7,143), and hence it is difficult to obtain dentists for the government service.

Dental technicians are trained in vocational schools in evening classes. During the day, the student works in a laboratory or with a dentist. The course lasts four years. For 150 years, dental technicians in Denmark have been permitted to take impressions. A commission has been set up to study the matter, and it is generally assumed that such practice will be stopped. Denmark has no formal training courses for dental assistants, and there are no dental hygienists.

The country's only dental school is the Royal Dental College of Copenhagen, built in 1939-41, with a capacity of 100 students per class. The college is a state school supervised by the Ministry of Education. A planned addition will double the size of the building, and the size of classes will be increased from 100 to 125 students. Plans are under way to build a new school in Jutland to accommodate 75 students per class. University education in Denmark is free, but students in dental schools pay a tenth of the cost of operating the school; thus each dental student pays about 400 kroner (\$59) a year. It is planned, however, that these fees will be eliminated soon. About 300 students apply for the predental course each year, but only 200 can be accepted. A four-year course leads to a Degree in Dental Surgery; the higher degree of Doctor of Odontology is awarded on a thesis based on advanced research work.

234 St. George Street, Toronto, Ontario, Canada

## General

**Considerations in the settlement of estates in the matter of dental practice**

Arthur M. Gee. *J.Canad.D.A.* 24:589-590  
Oct. 1958

On the death of a dentist, the widow, or those responsible for settling the estate, should have a trusted person remove any valuables and personal papers from the office immediately and close the office with a notice on the door stating that the office will be open within two days. The dental assistant should be retained for at least a month and the office should be open during the usual hours. Arrangements should be made with another dentist so that patients whose treatment is not complete will be cared for, and the assistant so advised.

The assistant should be instructed to record all money paid, in the usual manner, to bring all accounts receivable records up to date, and to prepare statements for all dental fees whether the treatment is completed or incomplete. She should be instructed to take the name, address and telephone number of inquiring patients, and to say that "arrangements may be made in order that you may continue to come to this office, and if you will be patient with us, I shall advise you, by telephone, just as soon as I know."

Advice should be sought from personal friends in the profession as to the possibility of sale of the practice. A general dental practice without a dentist usually consists of two things: patients and fixed assets. The salability of a practice depends on such factors as the value of the location, layout of the office, modernity of equipment, types of patients regularly treated, number of dentists in the immediate area, availability of potential purchasers, economic conditions at the time, and the time of year relative to the graduation of new dentists. The value of good will and

of the lease usually is negligible, at least under present conditions.

The dental supply dealer often can render a useful service in determining the value of the practice and in acquainting prospective dentists with the opportunity to purchase. If the practice is deemed unsalable and if the equipment is old, it should be offered to the dental dealer on a competitive basis and any valueless equipment should be sold as scrap. If the practice is deemed salable, the executives of the local dental association should be so advised. An advertisement should be inserted in the professional dental publications.

The purchaser may offer to place an amount of money down as part payment and to repay the balance either as a percentage of his practice volume or at a monthly rate. It is advisable to retain the services of the dental assistant until the practice has been sold or dissolved; her services will be of prime importance to the prospective purchaser.

40 Main Street West, Hamilton, Ontario, Canada

**Production of tetracycline hydrochloride in Czechoslovakia**

M. Dohnal and V. Vlček. *Rev. Czechoslov.Med.* 4:40 Jan.-March 1958

Tetracycline, although one of the most recently discovered antibiotics of the group which also includes chlortetracycline and oxytetracycline, has acquired greater use in modern dental practice than any other antibiotic agent on account of its superior properties.

Although the antibiotics of this group are closely related chemically, the advantages of tetracycline are its greater stability at an acid or alkaline pH, its increased permeability and the significantly lower incidence of gastrointestinal disturbances.

Previously, tetracycline hydrochloride (in capsule or tablet form) had to be imported. The production of this effective antibiotic in quantities adequate to satisfy the demands of dental and medical practice has been initiated recently in Czechoslovakia.

The Czechoslovakian tetracycline hydrochloride was tested at the Research Institute of Anti-

biotics in Roztoky, near Prague. The purity of the drug and its effectiveness against gram-positive and gram-negative microorganisms met the standards of both the Czechoslovakian Pharmacopeial Convention and the fifteenth revision of the *United States Pharmacopeia*.

At present, the Czechoslovakian tetracycline hydrochloride is available only in the form of coated tablets containing 250 mg. of the antibiotic and water-soluble excipients. The weight of a tablet is 0.64 Gm., the diameter 11.5 mm. The tablet decomposes in water in about seven minutes.

Basic tests confirm that the Czechoslovakian tetracycline hydrochloride is of equal value to the preparations from other countries used as controls. Side effects such as transitory nausea, vomiting and irritation of the gastrointestinal tract appeared milder and were less often experienced in the experimental group than in controls. There were no serious toxic effects.

*Antibiotics Research Institute, Roztoky near Prague, Czechoslovakia*

#### **Use of medicated soaps for disinfection of the hands of dentists and surgeons**

H. Weitgasser. *Wien.med.Wschr.* 108:542-545 April 4, 1958

Manufacturers of medicated soaps, containing hexachlorophene and saponified fats, claim that their products have bactericidal effects. Unfortunately, these claims were repeated by several authors whose reports appeared in medical and dental literature.

Serial tests, carried out at the Dermatological Institute of the Regional Health Insurance of Styria, Graz, Austria, have established that four brands of medicated soaps (alcoholic, lavender-scented solutions) are of limited value in disinfection of the hands of dentists and surgeons.

Bacteriological examinations revealed that after repeated washings (before and after surgical interventions) the number of microorganisms on the hands did not decrease. Pre-existing dermatoses were aggravated by repeated use of the medicated soaps.

The disinfecting effect of these soaps is not

greater than that of any neutral soap containing sodium or potassium salts of oleic, palmitic and stearic acids.

Although the toxicity of the soaps investigated appeared to be comparatively low, prolonged contact between the soaps and the skin of the hands produced irritations.

Similar tests, also negative, were carried out with "Prolergan" and "Red Sulphoral" soaps which do not contain hexachlorophene. The manufacturers of these brands claimed that their products contained antihistaminic drugs. No such drugs were found in the soaps; the value of antihistamines in disinfection of the hands of dentists or surgeons is questioned. Because of the lack of evidence to demonstrate their value, medicated soaps—even if they contain antihistamines—cannot be recommended for clinical use.

*Ambulatorium für Dermatologie, Steiermärkische Gebietskrankenkasse, Graz, Austria*

#### **The potential role of the dental hygienist in public health programs**

Martha H. Fales. *Am.J.Pub.Health* 48:1054-1058 Aug. 1958

Of 848 dental hygienists graduating in June 1957, only 36 (4.2 per cent) accepted public health positions. The supply of public health dental hygienists is limited. Present workers and their talents must be employed to the best possible advantage so that newer graduates will be attracted to public health.

The value of auxiliary dental personnel in private practice has been documented. When public health dentists fail to utilize auxiliary personnel in their public health programs, they do not extend their dental services to as many people as possible and do not get full value for each budget dollar.

There are many tasks which dental public health administrators could delegate legally to dental hygienists, to free themselves for more important professional dental activities. Conservative estimates indicate that one public health dentist should be responsible for four dental hygienists before adding another public health dentist to his staff.

The dental hygienist with two years of technical training in dental hygiene skills and a state

license can be utilized in the following tasks: educating individual patients concerning dental procedures; informing patients and parents of anticipated procedures; teaching patients the requirements and routines of the clinic; teaching patients dental health facts; screening patients; making community dental surveys; taking roentgenograms; doing prophylactic work; applying fluoride topically; making occlusal evaluations; coding findings; making models; helping patients carry out exercises, and taking charge of supplies.

Still better equipped for public health work are the dental hygienist with a bachelor's degree and the dental hygienist with graduate training in public health.

Some trained but inactive dental hygienists whose families no longer demand their complete time could be encouraged to return to work.

To maintain dental hygienists now in public health work and to attract new hygienists, they must be given more responsibility and greater opportunities to use their capacities to the fullest. If each dental health officer would delegate one new responsibility to his dental hygienist, more dental hygienists would be attracted to public health programs.

*Health Department, Brookline, Mass.*

#### **Enamel and dentin: an ontogenic and phylogenic study**

A. Keil. *Kartei zahnärztl. Praxis* 8:9-10  
June 1958

The bulk of a human tooth is formed by dentin which is covered by enamel, a derivative of ectodermal epithelium. In structure and development the human tooth shows similarity to hair, feathers and scales. Phylogenically, the dentin is the oldest of the hard tooth substances. Lower vertebrates, such as most of the fish species, have teeth without enamel. In some species, the dentinal body is covered by an enamel-like layer, called "durodentin." Ontogenically, even these uncomplicated teeth have enamel germs which, however, are not able to produce enamel. The primary function of the enamel germ is the development of the external form of the tooth; the secondary function is the protection of undisturbed tooth development.

In a later phylogenic period (in Amphibia), the enamel germ develops the true enamel from epithelial rudiments. The enamel of Amphibia and reptiles, however, shows no microscopic prismatic or prismoid structure. Only in mammalian teeth can the enamel prisms be observed.

The tooth cementum also developed later than the dentin. The tooth dentin of lower vertebrates is directly attached to specific alveolar bone. To the phylogenically older hard tooth substances, dentin and enamel, the cementum is later added as the last differentiation.

In the sperm whale, the ability of enamel germs to produce enamel was first retarded and later lost: a true example of atavism in tooth evolution.

The homodont dentition of most fish and reptiles gradually changed into the heterodont dentition of the mammals where the teeth finally differentiated to specific tooth groups as incisors, canines, premolars and molars.

The acquisition and progressive perfection of masticatory function produced a profound change in the attachment of the tooth to the jaw. In fish and reptile species, there was either a ligamentous or connective tissue junction of tooth and alveolar bone or—in isolated instances—an ankylotic union. In mammals, the teeth developed one or more roots which were enclosed in bony sockets and attached to them by suspensory ligament.

During the later evolutionary periods, the functional life span of a tooth became almost identical with the life span of the mammal, which was unable to compensate for restricted replacement by some other specialization of their dentition.

*Zahnärztliches Institut, University of Giessen, Germany*

#### **Atom sub life hard on crew's teeth: decay is double rate of other sailors**

William R. Stanmeyer. *Washington Post* 81:1  
Nov. 20, 1958

There is something about life aboard an atomic submarine that exerts an unfavorable influence on human teeth. This unexpected finding was revealed by a series of investigations carried out at the dental research department of the U.S. Navy Medical Research Laboratory, New London, Conn., a submarine base.

The investigators, however, could not determine what factor causes the teeth of atomic submariners to decay at a rate apparently twice that occurring in other sailor groups. Further studies with humans and experimental animals are planned to obtain additional evidence and to solve this problem.

At the moment, the suspected factors include the excessive content of carbon dioxide in the air which the men must inhale during the prolonged under-water trips, the increased noise levels and the loss of alternating periods of light and dark. All of these factors are under investigation as the possible causes of cariogenic activity. Atomic radiation, however, can be ruled out as a possible cause.

An 18 month study of the teeth of crews who had spent most of their time in the closed environment of an atomic submarine showed a 100 per cent increase in incidence of dental caries over the control group of sailors living on surface vessels or ashore.

It can be assumed that a further increase in the incidence of caries will occur in future space crews, although perhaps from other causes. Space travelers will not only be living in close environments but will likely consume a liquid diet.

Atomic submariners also suffer from more pathologic disturbances of their gingival and periodontal tissues than land-locked or surface sailors. The cause of a third complaint, burning of the lips and of the oral mucosa, has been traced to the escaping freon gas in the refrigerating system of the submarine.

*Medical Research Laboratory, U. S. Navy,  
New London, Conn.*

### **Naming of drugs on prescription labels**

Editorial. *J.A.M.A.* 169:1338 March 21, 1959

Most prescription labels bear only the name and address of the pharmacy, its prescription file number, the names of the patient and physician, and the latter's directions for use. The absence of any display of the name of the prescribed drug or drugs appears to be a matter of custom, although intentional secrecy by using Latin or Greek terms

largely has been superseded by the use of English for writing prescriptions. Mutual confidence between the physician, or dentist, and the patient is likely to be enhanced by the plain designation of the principal ingredients on the prescription label. The directions for administration often are too complex and varied to be encompassed on a small label; in some instances, the warning to take only as directed by the physician may be the most useful inscription.

Identification of prescribed medication on prescription labels also may aid physicians other than the prescriber, as well as dentists, who may be consulted for the same or for a different ailment. Even the original prescriber may be unable to recall or find a record of the precise medication prescribed for a patient whom he has not examined recently. Moreover, the identification of a prescribed drug may be urgent in emergencies which involve a question of accidental poisoning, unintentional overdosage or attempted suicide. Also, there may be other more or less urgent situations in which a clinic or private patient is obliged to consult or call an alternate physician for refill of a prescription, the identity of which can be determined only by contacting the office of the prescriber or the dispensing pharmacy.

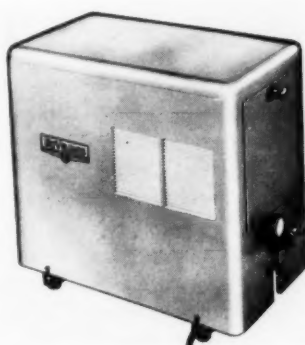
Although display of the names of prescribed drugs on prescription labels can be advantageous, there are some patients for whom it may be unwise to reveal such information. These might include patients with mental disturbances, diseases known to have a fatal outcome, or any condition likely to be aggravated by a knowledge of its consequences, particularly if the name of the drug prescribed has a specific connection with the diagnosis. Another unfortunate aspect of prescription drug identification lies in the encouragement it may provide for sharing unused medication with another person who has or is assumed to have the same illness.

Although this is a delicate matter which should be left to the judgment of the practitioner in each individual instance, in a somewhat larger section of the public than in former days the naming of drugs on prescription labels will work for good rather than for harm.

*535 North Dearborn Street, Chicago 10, Ill.*

New equipment

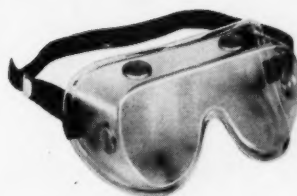
*The information reported here is obtained from manufacturers. Dental Abstracts does not assume responsibility for the accuracy of the information. The interested reader may direct his inquiry to the manufacturer.*



A new dental air compressor designed for the operation of air rotor handpieces consists of a single stage, twin cylinder compressor, a  $\frac{3}{4}$ -horsepower motor and a seven-gallon tank. The compressor delivers 4 cubic feet of air per minute at 40 pounds of pressure. It will operate one or two rotor handpieces and such auxiliary equipment as sprayers, blowers and dusters, simultaneously. Model 606 has a hood and Model 605 has no hood. *DeVilbiss Co., Somerset, Pa.*

A self-adhesive "Safety Marker" tape that glows in the dark for many hours after exposure to light is offered as a safety device for the dentist's darkroom. No wires or electricity are needed. The marker can be placed anywhere. The safety tape is available in a roll 30 by 1 inch. *American Advertising Co., 39 Cortlandt St., New York 7, N. Y.*

The "Kromi" combination tongue and cheek retractor and reflector is recommended for use in dental examinations, high-speed drilling and polishing. It is available in sizes for children or adults, left and right. *Union Broach Co., Inc., 80-02 Fifty-first Ave., Elmhurst 73, N. Y.*



"Dental Eyeguards," designed to protect the eyes of dentists, dental assistants and dental technicians, are made of optically clear Lucite and may be worn with or without glasses. The eyeguard permits unobstructed vision on all sides, and protects the user's eyes from dust, liquids and flying objects. The elastic headband is adjustable, and the ventilated eyeguard is available in widths of 5, 5 $\frac{1}{2}$  and 6 inches. *Protective Clothing Co., P.O. Box 8076, Pittsburgh 16, Pa.*

"Liqua-Band" is a liquid antiseptic that forms its own bandage. Brushed on a minor cut, abrasion, burn or blister, it immediately forms a porous, flexible bandage that will provide protection against infection while permitting normal movement of the hand. Hands can be washed without affecting the bandage. *Newell Pharmacal Division, Seaboard Chemical Corp., 88 Naylon Ave., Livingston, N. J.*



Two new air compressor models are available. Model 420 displaces 4.2 cubic feet per minute—adequate to operate two turbine handpieces simultaneously, while supplying air for all other dental office requirements. An economy unit, Model J, also is available. *Pelton & Crane Co., Charlotte 3, N.C.*

Doctoral and Masters' dissertations

*In this column each month are listed recent Doctoral and Masters' dissertations of dental interest, accepted by the dental schools or graduate schools in partial fulfillment for advanced degrees. Copies of many of these theses are available from the schools through interlibrary loan.*

Impression procedure for removable partial dentures. *Wallace William Johnson*. 1958. M.S. *State University of Iowa*.

The complete dental examination. *Willard Grenlee Fischer*. 1958. M.S. *State University of Iowa*.

The triangulator: a direct method of determining the Frankfort-mandibular and incisor-mandibular plane angles. *Charles L. Weaver*. 1959. M.S. *University of Kansas City*.

Wound healing after a single incision in the oral cavity. *Henry R. Mittelman*. 1958. M.S. *Loyola University (Chicago)*.

A study of the changes occurring on the tension side of the periodontal ligament when a heavy controlled force is applied for a short period of time. *Ralph I. Mosher, Jr.* 1959. M.S.D. *University of Nebraska*.

A cephalometric analysis of the changes during treatment of various types of Class II Division 1 cases. *Cecil Bascomb Hall*. 1958. M.S. *University of North Carolina*.

The early development of bone in the chick. *Lloyd E. Church*. 1959. Ph.D. *George Washington University*.

A study of dental and skeletal profile changes of children undergoing orthodontic treatment. *Francis G. Jones*. 1959. M.S.D. *University of Washington*.

Sagittal and transversal anlage of the tooth buds of bicuspid in boys and girls from six to eleven years old (Die sagittale und transversale Zahnkeimanlage der Prämolaren bei Knaben und Mädchen von sechs zu elf Jahren alt). *Rudolf Vockerodt*. 1958. DR.MED.DENT. *University of Kiel, Germany*.

Clinical treatment of osteomyelitis occurring in the maxillofacial region: osteomyelitis sicca (Beitrag zur Klinik der Osteomyelitis im Kiefer-Gesichtsbereich: Unter besonderer Berücksichtigung der Osteomyelitis sicca). *Irmgard Schlegel-Pokriefke*. 1957. DR.MED.DENT. *Free University of Berlin, Germany*.

Attrition and changes in tooth position in periodontal disease causing abnormal occlusion (Abrasion und Zahnstellungsänderungen bei Parodontopathien die Veränderungen der Bisslage verursachen). *Ulrich Kathke*. 1957. DR.MED.DENT. *Free University of Berlin, Germany*.

Experimental caries produced in extracted human teeth through in vitro application of acid phosphatase (Künstliche Karies erzeugt an extrahierten menschlichen Zähnen durch in vitro Verwendung von saurer Phosphatase). *Bernhard Matusek*. 1957. DR.MED.DENT. *Free University of Berlin, Germany*.

Root canal treatment with high-frequency current: the "Joulisator" apparatus (Die Wurzelbehandlung mit hochfrequentem Strom: Der "Joulisator" Apparat). *Hans Brühl*. 1957. DR.MED.DENT. *University of Bonn, Germany*.

Exogenous and endogenous disturbance in the development and calcification of the hard substances in animal teeth (Über exogene und endogene Störungen im Aufbau und in der Mineralization tierischer Zahnhartsubstanzen). *Dumitro Bandrabur*. 1958. DR.MED.DENT. *University of Bonn, Germany*.

The anlage of the tooth buds in incisors, its importance for the development of the dentition and its determination (Die Keimanlage der

Schneidezähne, ihre Bedeutung für die Gebissentwicklung und ihre Feststellung). *Güher Alpaouti*. 1958. DR.MED.DENT. *University of Bonn, Germany*.

Functional and esthetic improvements in inadequately repaired cleft lip and cleft palate (Beitrag zur funktionellen und kosmetischen Verbesserung bei schlecht operierten Lippen- und Gaumenspalten). *Werner Dobenecker*. 1958. DR.MED.DENT. *University of Bonn, Germany*.

Studies of the changes in the form of the dentition after orthodontic treatment (Untersuchungen über die Veränderungen der Gebissform nach Abschluss einer kieferorthopädischen Behandlung). *Hans Herr*. 1958. DR.MED.DENT. *University of Bonn, Germany*.

Roentgenographic studies of the diffusion of the anesthetic deposits and of the position of the injection needle in anesthesia of the mandibular foramen (Röntgenologische Untersuchungen über die Ausbreitung des Anästhesiedepots und der Lage der Injektionsnadel bei der Anästhesie am Foramen mandibulare). *Erwin Wälti*. 1958. DR.MED.DENT. *Medical Academy of Düsseldorf, Germany*.

Responsibility of dentists in malpractice suits according to the civil and criminal laws (Die zivil- und strafrechtliche Verantwortung von Zahnärzten für Kunstfehler in der Praxis). *Rolf Tegethoff*. 1958. DR.MED.DENT. *Medical Academy of Düsseldorf, Germany*.

Relations between the form of the palate and that of the nasal fossa (Beziehungen zwischen der Gaumenform und dem Naseninneren). *Richard Lindt*. 1958. DR.MED.DENT. *Medical Academy of Düsseldorf, Germany*.

Oral hygiene of exotic people (Über die Mundhygiene exotischer Völker). *Wilhelm Müller*. 1957. DR.MED.DENT. *University of Leipzig, Germany*.

Distocclusion in orthodontics and oral surgery (Der Distalbiss in Kieferorthopädie und Chirurgie). *Eberhard von Glass*. 1958. DR.MED.DENT. *University of Munich, Germany*.

Hydrocortisone and prednisone in the treatment of acute and chronic diseases of the gingiva, especially in hypertrophic gingivitis (Hydrocortison und Prednisolon bei akuten und chronischen Erkrankungen der Gingiva unter besonderer Berücksichtigung der Gingivitis hypertrophicans). *Bernhard Haberl*. 1958. DR.MED.DENT. *University of Munich, Germany*.

Premedication in dental and surgical interventions (Prämedikation bei zahnärztlichen und chirurgischen Eingriffen). *Marie Theres Weiss*. 1958. DR.MED.DENT. *University of Munich, Germany*.

Surgical treatment of carcinoma of the upper jaw (Zur operativen Behandlung der Oberkiefercarcinome). *Johannes Bäumer*. 1958. DR.MED.DENT. *University of Münster, Germany*.

Occurrence and roentgenographic determination of vascular canals in the region of the alveolar process (Über das Auftreten und den röntgenologischen Nachweis von Gefässkanälen im Bereiche des Alveolarfortsatzes). *Günther Kettenring*. 1957. DR.MED.DENT. *University of Würzburg, Germany*.

Experiences with the "McKesson Easor nitrous oxide anesthesia apparatus" in operative dentistry (Erfahrungen mit dem "McKesson Easor Lachgasgerät" in der konservierenden Zahnheilkunde). *Babette Schärf*. 1957. DR.MED.DENT. *University of Würzburg, Germany*.

Effect of pulpectomy and high-frequency diathermy on the apical periodontium of dogs (Der Einfluss der Vitalexstirpation und der Hochfrequenzdiathermie auf das apikale Parodontium beim Hund). *Hans Dräger*. 1958. DR.MED.DENT. *University of Münster, Germany*.



Contents

**Roentgenology**

- Televised roentgenography. *Botden*.....3  
 Roentgen-ray phantoms. *Roderick*.....4  
 Two projections compared. *Lundberg*.....6  
 Injuries from ionizing rays. *Fuchs*.....6  
 Survey of x-ray units. *Gorson*.....7

**Anatomy**

- The 'dentin lesion.' *Keil*.....8  
 Anatomy of the mandible. *Gabriel*.....10

**Education**

- Periodontics in Turkey. *Gurkan*.....11  
 Canadian Dental Corps School.....11

**Physiology**

- Curvature of tooth roots. *Kovacs*.....12  
 Variability of tooth formation. *Garn*.....14  
 Eruption of permanent teeth. *Hargreaves*...14  
 Continuous cementum apposition. *Zander*...15

**Operative dentistry**

- Temporary restorations. *Mumford*.....16  
 Effects of cavity preparation. *Hori*.....18

**Prosthetic dentistry**

- A silicone resilient plastic. *Lammie*.....19  
 Partial denture construction. *Craddock*.....20  
 Role of buccinator muscle. *Lundquist*.....20  
 Study of mastication. *Craddock*.....21

**Periodontics**

- Study of healing process. *Sato*.....22

**Orthodontics**

- Clinical orthodontics. *Nord*.....23  
 Orofacial morphology. *Leech*.....24

**Pedodontics**

- A simple space maintainer. *Humphrey*.....25  
 Study of infraocclusion. *Karwetzky*.....26  
 Use of stannous fluoride. *Norris*.....26

**Plantation**

- Subperiosteal implants. *de Grady*.....27  
 Transplantation of cartilage. *Krenar*.....28  
 Transplantation. *Kominek*.....29

**Anesthesia and analgesia**

- Promethazine hydrochloride. *Solomon*.....30  
 Assaying anesthetics. *Auerbach*.....30

**Fractures**

- Diagnosis and management. *Bernard*.....31  
 Fractures of condyloid process. *Dessner*.....31  
 Tooth fracture by indirect blow.....32  
 Teeth on fracture line. *Evdokimov*.....32

**Oral surgery**

- Myxomatous tumors. *Zimmerman*.....33  
 Mechanical aids in trismus. *Knight*.....33  
 Ether in trigeminal neuralgia. *Coker*.....34  
 Stabilizing cement packs. *Bassmann*.....35

**Oncology**

Epidemiology of cancer.....	36
Salivary tumors of lips. <i>Sharma</i> .....	36
Early diagnosis. <i>Van Dellen</i> .....	37
Adamantinoma of jaw. <i>Srivastava</i> .....	37
Osteogenic sarcoma of jaws. <i>Kragh</i> .....	38

**Case reports**

Sensitivity to tooth paste. <i>Krook</i> .....	39
Positional vertigo .....	39
Transposition of teeth. <i>Porter</i> .....	40
Lymphosarcoma of jaw. <i>Mena</i> .....	40

**Therapeutics**

Effect of growth hormone. <i>Bixler</i> .....	41
Control of salivation. <i>Masters</i> .....	41
Use of tetracyclines. <i>Škach</i> .....	42
Antibiotic lozenges. <i>Myerson</i> .....	42

**Public health dentistry**

Dentistry in New Zealand. <i>Bibby</i> .....	43
Vocational rehabilitation. <i>Rusk</i> .....	44
Australian caries study. <i>Se'ith</i> .....	44
Need for 'fibrous chew.' <i>Cooke</i> .....	45
Handicapped children. <i>Menczer</i> .....	46
Dental care for children.....	46
Uptake of fluoride. <i>Ericsson</i> .....	47

**Anthropology**

Teeth of Etruscan skulls. <i>Gordian</i> .....	48
--	----

Dental customs of Batongas. <i>Ritchie</i> .....	48
Growth of elephant tusk. <i>Colyer</i> .....	49

**History**

Hugo Carl Plaut.....	50
History of dentistry. <i>Rinderer</i> .....	50
History of orthodontics. <i>Rinderer</i> .....	51

**Practice administration**

Billing and collection.....	53
-----------------------------	----

**Dentistry around the world**

Dentistry in Denmark. <i>Gullett</i> .....	54
--	----

**General**

Settlement of estate. <i>Gee</i> .....	55
Tetracycline in Czechoslovakia. <i>Dohnal</i> .....	55
Medicated soaps for hands. <i>Weitgasser</i> .....	56
Role of dental hygienist. <i>Fales</i> .....	56
Study of enamel and dentin. <i>Keil</i> .....	57
Caries in submarine crew. <i>Stanmeyer</i> .....	57
Labeling of drugs.....	58

**New equipment**

Equipment news .....	59
----------------------	----

**Doctoral and Masters' dissertations**

Dissertations .....	60
---------------------	----

PLEASE NOTE: A subscriber to DENTAL ABSTRACTS, in whatever country he resides, has the right to borrow without charge any of the original articles abstracted in this publication. Requests for articles should be addressed to the Bureau of Library and Indexing Service, American Dental Association, 222 East Superior Street, Chicago 11, Illinois, U.S.A.

# Index of authors

Agrawal, S. 36  
Aitken, Edward V. 7  
Auerbach, Morris E. 30

Bassmann, A. H. 35  
Bernard, Frank D. 31  
Bibby, J. B. 43  
Bixler, David 41  
Botden, P. 3

Coker, Melvin 34  
Colyer, Frank 49  
Comas, Gaston 40  
Cooke, B. 45  
Costa, Osvaldo 40  
Craddock, F. W. 20, 21

Dahlin, David C. 33, 38  
Davenport, Gordon 31  
de Grady, Martin 27  
Dessner, L. 31  
Dohnal, M. 42, 55

Erich, John B. 38  
Ericsson, Yngve 47  
Evdokimov, A. I. 32

Fales, Martha H. 56  
Ferguson, H. W. 16  
Fuchs, G. 6

Gabriel, A. C. 10

Garn, S. M. 14  
Gee, Arthur M. 55  
Gordian, Fritz 48  
Gorson, Robert O. 7  
Gullett, Don W. 54  
Gurkan, Suat Ismail 11

Halvorsen, Ronald M. 7  
Hargreaves, A. 14  
Herman, Samuel S. 44  
Holm, O. F. 31  
Hori, Yasumasa 18  
Humphrey, William P. 25  
Hürzeler, Beat 15

Karwetzky, Rudolf 26  
Keil, Albert 8, 57  
Knight, J. S. 33  
Kominék, J. 29  
Kominková, O. 29  
Kovacs, Imre 12  
Kragh, Lyle V. 38  
Krenar, J. 28  
Krook, Gösta 39

Lammie, C. A. 19  
Leech, H. L. 24  
Lewis, A. B. 14  
Lieberman, Jesse 7  
Lowell, Richard J. 30  
Lundberg, M. 6  
Lundquist, Donald O. 20

Marken, K. E. 6  
Masters, Donald H. 41  
Menczer, Leonard F. 46  
Mena Serra, Raul 40  
Miles, A. E. 49  
Moore, J. R. 33

Michněvičová, A. 42  
Muhler, Joseph C. 41  
Mumford, J. M. 16  
Myerson, Mervin C. 42

Nord, Ch. F. L. 23  
Norris, Paul E. 26

Polacheck, D. L. 14  
Porter, Kendall 40

Rinderer, L. 50, 51  
Ritchie, James 48  
Roderick, J. F. 4  
Rusk, Howard A. 44

Sato, Mamoru 22  
Seith, P. W. 44  
Shafer, William G. 41  
Sharma, K. D. 36  
Shrivastav, J. B. 36  
Šikrória, K. C. 37  
Škach, M. 42  
Solomon, Alvin L. 30  
Srivastava, S. P. 37  
Stammeyer, William R. 57  
Storer, R. 19

Tuckerman, Murray M. 30

Van Dellen, T. R. 37  
Vlček, V. 42, 55

Weitgasser, H. 56

Zander, H. A. 15  
Zimmerman, Donald C. 33

## CONTRIBUTING ABSTRACTERS

### Finnish, Russian

BARBARA KESSLER, M.D.  
T. B. COOLIDGE, M.D.

### Greek

THEO. J. CALOCASSIDES, D.D.S.

### Japanese

MASAO ONISI, D.M.S.C.

### Danish, Norwegian, Swedish

GUNNAR RYGE, D.D.S.  
SOREN SORENSON, ODONT.D.

### Spanish, Portuguese

J. J. BARROS, D.D.S.  
ELOISA DEBARROSO  
JOSEFA THORNTON  
GEORGE FRENCH, D.D.S., M.D.

### Medical

A. F. BARANOFF, D.D.S.

